SONY

DME SWITCHER

DFS-700
DFS-700P

DIGITAL/ANALOG INPUT BOARD

BKDF-701

ANALOG COMPOSITE INPUT BOARD

BKDF-702/702P

DIGITAL MULTI EFFECTS BOARD

BKDF-711

3D VIDEO MAPPING EFFECTS BOARD

BKDF-712

SERVICE MANUAL

Volume 1 1st Edition

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

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Manual Structure

Purpose of this manual

This manual is the service manual Vol.1 of the DME Switcher DFS-700/700P and their optional boards.
The service manuals (Vol.1 and Vol.2) are intended for use by trained system and service engineers, and describes the information on installing, maintenance, and detailed service.

This manual (Vol.1) describes the operating instructions, service overviews, diagnosis, and electrical alignment.

Related manuals

Besides this Service Manual Vol.1, the following manuals are available for the DFS-700/700P.

- **Service Manual Vol.2**
  Part No. 9-967-898-01 (for J, UC, CE)
  Contains the spare parts, semiconductor pin assingments, block diagrams, schematic diagrams, and board layouts.

- **"Semiconductor Pin Assignments" CD-ROM (available on request)**
  This "Semiconductor Pin Assignments" CD-ROM allows you to search for semiconductors used in Communication System Solutions Network Company equipment. Semiconductors that cannot be searched for on this CD-ROM are listed in the service manual for the corresponding unit. The service manual contains a complete list of all semiconductors and their ID Nos., and thus should be used together with the CD-ROM.
  Part number: 9-968-546-XX

Contents

This manual is organized by following sections.

Section 1 Operating Instructions
This section describes the Operation Manual supplied with the DFS-700/700P.

Section 2 Service Overview
This section explains the information that is required for installing (the operating conditions, power supply and power cords, installaion of the optional board, rack mounting, adaptive connectors), outline of the board circuit, replacement of the parts, switch setting on the board, error indication, and tools and adjustment equipment.

Section 3 Self-diagnosis
This section explains the activation (termination) of the check mode in this unit, the basic operation, and the check method.

Section 4 Electrical Alignment
This section explains the adjustment of the OPM-39, IPM-69, VIF-19, and VIF-20 boards.

SONY

3-203-834-11(1)

DME Switcher

Operating Instructions
Before operating the unit, please read this manual thoroughly and retain it for future reference.

DFS-700/700P

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Section 1
Operating Instructions

This section is extracted from operation manual.

Owner's Record

The model and serial numbers are located in the rear. Record these numbers in the spaces provided below. Refer to them whenever you call upon your Sony dealer regarding this product.

Model No._____ Serial No._____

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

For customers in the USA (DFS-700 only)
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

Caution
Television programs, films, video tapes and other materials may be copyrighted.
Unauthorized recording of such material may be contrary to the provisions of the copyright laws.

For the customers in Europe (DFS-700P only)
This product with the CE marking complies with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.
Compliance with these directives implies conformity to the following European standards:
- EN60950: Product Safety
- EN55103-1: Electromagnetic Interference (Emission)
- EN55103-2: Electromagnetic Susceptibility (Immunity)

This product is intended for use in the following Electromagnetic Environment(s):
E1 (residential), E2 (commercial and light industrial), E3 (urban outdoors) and E4 (controlled EMC environment, ex. TV studio).

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Chapter 1

Overview

Features of This System

The Sony DFS-700/700P DME Switcher is a Digital Multi Effects system, offering high-performance effects at high image quality. The system consists of a processor unit and control panel.

Support for fully digital component systems with SDI inputs and outputs

This system provides SDI interfaces as standard equipment. This allows it to be incorporated in fully digital linear editing systems using DVCAM-series, Betacam SX-series, and other digital VCRs.

Advanced special effects

This system is equipped with advanced special effects, including trail, lighting effects, ripple, swirl, and explosion.
Installing the optional BKDF-711 board adds a second DME channel, and the optional BKDF-712 board enables 3D mapping effects to be used.

For details of option boards, see page 1-3.

Support for wide range of input/output signal formats

- There are eight inputs as standard (VIDEO INPUT 1 to 8).
  VIDEO INPUT 1 to 4: SDI (serial digital interface) signals
  VIDEO INPUT 5 to 8: analog component signals. VIDEO INPUT 8 can also be used as an analog RGB signal input.
  Installing the optional BKDF-701 board allows all eight inputs to be used as either SDI or analog component inputs.
  Installing the optional BKDF-702/702P board allows four inputs to be used as either Y/C (S-video) or analog composite inputs.

  For details of option boards, see page 1-3.

- The standard outputs are two each of SDI, analog component, analog composite, and Y/C, for a total of eight outputs.

Comprehensive title key functions

Luminance keys, chroma keys, and downstream keys are all provided as standard functions.

Features of This System

Color correction function

A YUV color correction function is provided for white balance adjustment and general color adjustment.

User program effect and snapshot function

- **User program effects:** This system has a large number of built-in effects, but also allows the user to create original effects, and save them in memory, for execution in the same way as the built-in effects. Up to twenty user program effect patterns, both linear and nonlinear, can be saved.
- **Snapshot function:** The processor unit includes snapshot registers 0 to 99, each of which can hold a snapshot of the control panel settings. These can then be recalled as required.

Aspect ratio selection

In the setup menu it is possible to select either 4:3 or 16:9 as the screen aspect ratio.

Easy operation for live broadcasting

The following features make this system suitable for live broadcasting from CATV studios and so on.

- Fully-equipped control panel offers easy operability for signal selection and transition setting.
- Parallel tally output and preview output supplied as standard

Interfacing with editors

This system is equipped with I/O interfaces for two sets of control signals, allowing operation together with various editing control units.

- **Nine-pin interface connector (one input/output):** for A/B roll editing (two players, one recorder) together with a PVE-500, BVE-2000 series, or other editing control unit
- **GPI (General Purpose Interface) and trigger signal connectors (two inputs):** for control from external equipment not fitted with the 9-pin interface

This system also supports the background through mode. If connected to a recorder VCR with a preread function, A/B roll editing with a minimum of two VCRs is possible. (In background through mode, the delay to the signal selected on the background bus of this system is 4H. Note that there are restrictions on the effect patterns that can be used for preread editing.)

External synchronizing connectors for higher editing precision

The system is provided with black burst outputs for synchronizing other connected devices, and a genlock input for synchronization to an external signal. This allows more precise editing.

Rack mounting

The processor unit can be mounted in an EIA standard 19-inch rack.

Option Boards

The DFS-700/700P system has the following option boards.

BKDF-701 SDI and Component Input Board

When this board is installed, it allows all eight video inputs to be used as either SDI or analog component inputs. When using this board, you can select the types of the optional inputs individually, using the setup menu.

BKDF-702/702P Y/C and Composite Input Board

When this board is installed, it allows four video inputs to be used as either Y/C (S-video) or analog composite inputs. When using this board, you can select the types of the optional inputs individually, using the setup menu.

BKDF-711 2nd Channel DME Board

This board provides a second DME channel, enabling two-picture box, two-picture brick, and other effects.

BKDF-712 3D Video Mapping Effects Board

This board provides 3D mapping effects, including 3D page turn, 3D beveled edge, and other effects.

Chapter 2

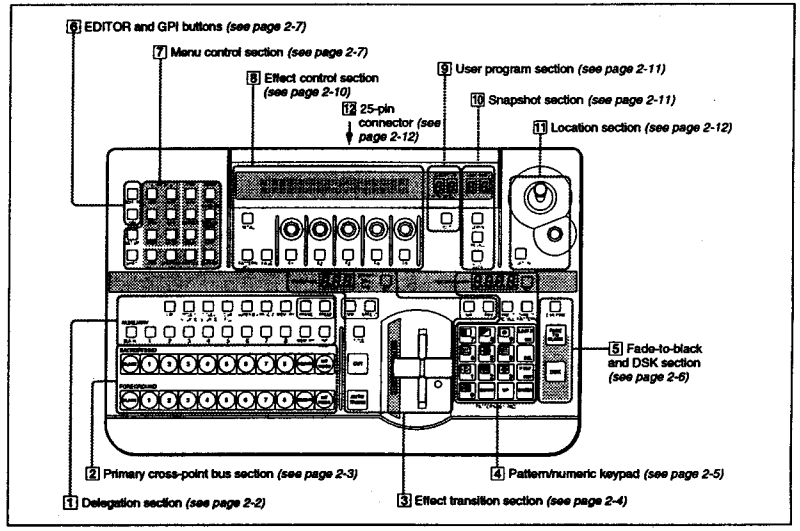
Location and Function of Parts and Controls

Control Panel

This section describes the control panel, which is divided into several sections, as shown below. See the page numbers shown in parenthesis for more details.

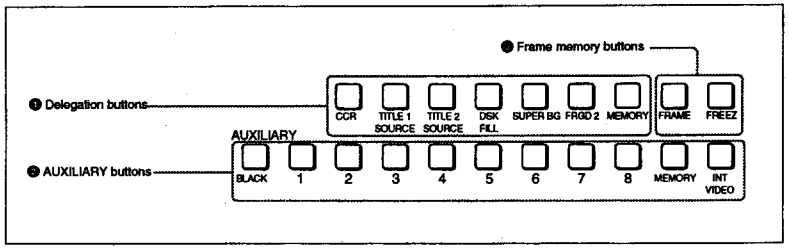
Note

If you make an error in operation, a warning sound may occur. You can switch off this audible warning *(see page 6-10)*.


6 EDITOR and GPI buttons (see page 2-7)
7 Menu control section (see page 2-7)
8 Effect control section (see page 2-10)
12 25-pin connector (see page 2-12)
9 User program section (see page 2-11)
10 Snapshot section (see page 2-11)
11 Location section (see page 2-12)
5 Fade-to-black and DSK section (see page 2-6)
2 Primary cross-point bus section (see page 2-3)
4 Pattern/numeric keypad (see page 2-5)
1 Delegation section (see page 2-2)
3 Effect transition section (see page 2-4)

Control Panel

1 Delegation section



❶ Delegation buttons
Use these buttons to delegate the input signal corresponding to the selected AUXILIARY button to the corresponding function. Pressing one of these buttons lights it, and the corresponding AUXILIARY button also lights. Any other previously lit delegation button goes off.

- **CCR (color corrector) button:** Signal for color correction
- **TITLE 1 SOURCE button:** Title 1 source signal for inserting characters and graphics using a title key
- **TITLE 2 SOURCE button:** Title 2 source signal for inserting characters and graphics using a title key (only available when the optional BKDF-711 2nd Channel DME Board is installed)
- **DSK (downstream keyer) FILL button:** Fill signal for the downstream keyer
- **SUPER BG (background) button:** Background image for 3D effects
- **FRGD (foreground) 2 button:** One of the foreground images for 3D effects
- **MEMORY button:** Signal captured in frame memory

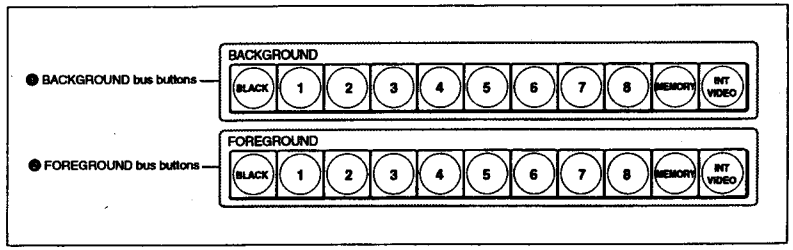
❷ AUXILIARY buttons
Select the input signal to be assigned to the function selected with a delegation button.
Select from the following buttons.

- **BLACK button:** Black burst signal generated by the internal synchronizing signal generator in this unit
- **Buttons 1 to 8:** Signals input to the VIDEO INPUT 1 to 8 connectors on the rear panel of the processor unit. You can set the assignment of buttons to input connectors in the setup menu.
- **MEMORY button:** Signal recorded in frame memory
- **INT (internal) VIDEO button:** Signal generated by the internal video signal generator

❸ Frame memory buttons

- **FREEZ button:** To capture the input signal selected by the MEMORY button in the delegation buttons (excluding the frame memory output signal) as a freeze image in frame memory, press this button, turning it on.
  Press once more to end the freeze, turning it off.
- **FRAME button:** Select whether to capture a frame or a field with the FREEZ button. Press this button, turning it on, to freeze a frame; when the button is off a field is captured.
  When capturing fields, you can select in the setup menu whether to capture an odd or an even field.

2 Primary cross-point bus section



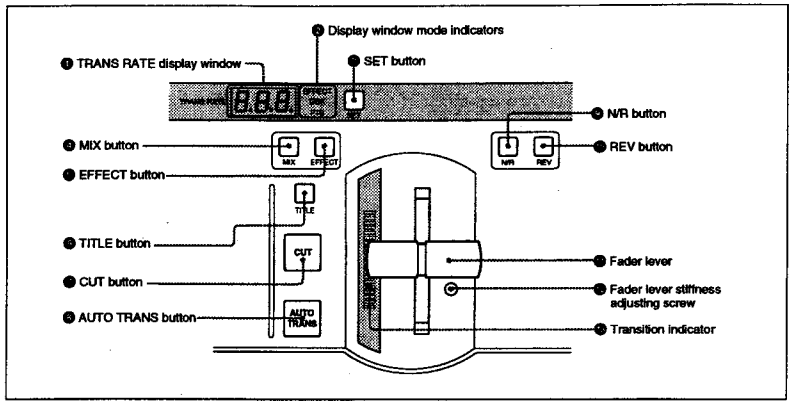
❶ BACKGROUND bus buttons
Select the image to form the background for an effect.
Select from the following buttons.

- **BLACK button:** Select the black burst signal generated by the internal synchronizing signal generator in this unit.
- **Buttons 1 to 8:** Signals input to the VIDEO INPUT 1 to 8 connectors on the rear panel of the processor unit. Press a button, turning it on, to select the corresponding signal.
  You can set the assignment of buttons to input connectors in the setup menu.
- **MEMORY button:** Select the signal recorded in frame memory.
- **INT (internal) VIDEO button:** Select the internal video signal selected by pressing the MATTES button in the menu control section. If you hold down this button and press the DOWN and UP buttons in the pattern/numeric keypad, the selected video signal pattern changes.

When the signal on the background bus is output from the PGM OUT connector on the rear panel of the processor unit, the button which has been pressed lights red.

❷ FOREGROUND bus buttons
Select the image to form the foreground for an effect (or the "new" video in a transition).
The functions of the buttons are the same as in the BACKGROUND bus buttons.
When the signal on the foreground bus is output from the PGM OUT connector on the rear panel of the processor unit, the button which has been pressed lights red. If the signal is not output, the button pressed lights amber.

3 Effect transition section



❶ TRANS (transition) RATE display window
This shows the transition time for effects, downstream keys, and fade-to-black, in units of frames. While you are entering a time, the dot at the lower right of each numeral lights.

❷ Display window mode indicators
These indicate the kind of transition time shown in the TRANS RATE display window.
EFFECT: Transition time of an effect
DSK: Transition time of a downstream key
FTB: Transition time of a fade-to-black

❸ SET button
To set the transition time for an effect, downstream key, or fade-to-black, press this button, turning it on. While it is lit, each time you press, the display window mode indicators change. To set the transition time corresponding to the display of the display window mode indicators, enter the value using the pattern/numeric keypad.

❹ MIX button
To carry out the next transition without applying an effect pattern, but as a mix, press this button, turning it on.

❺ EFFECT button
To carry out the next transition with an effect pattern applied, press this button, turning it on.

❻ TITLE button
To carry out an effect or a mix in title mode, press this button, turning it on. The title keying is carried out, inserting the characters and graphics with the effect pattern and transition settings applied.

❼ CUT button
Press this button to carry out an instantaneous transition.

❽ AUTO TRANS (automatic transition) button
Press this button to carry out an effect automatically. When you press this button, the effect is carried out automatically, with the transition time which has been set. During the transition this button is lit. Pressing this button during the transition pauses it. Press the button once more to resume the transition.
If you set the fader lever to an intermediate position and press this button, the transition pauses at the position corresponding to the fader lever position.

❾ N/R (normal/reverse) button
To carry out an effect in normal/reverse (i.e. alternating) mode, press this button, turning it on. It lights automatically for animation effects and title keys.

❿ REV (reverse) button
To carry out an effect in the reverse direction, press this button, turning it on.
For an effect for which normal/reverse (alternating) operation is possible, once the effect is carried out, the direction is automatically reversed. After an effect is carried out in the normal (i.e. forward) direction, this button lights. After an effect is carried out in the reverse direction, this button goes off.

⓫ Fader lever
Move this to carry out an effect transition manually.

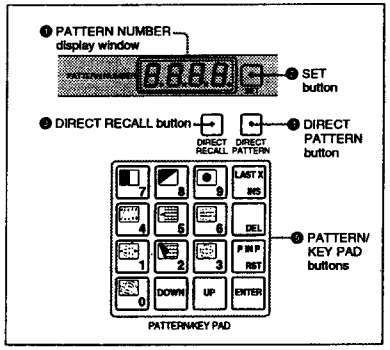
Note
After powering the system on, move the fader lever to the end of its travel once in each direction. This ensures that the fader lever will function correctly.

⓬ Fader lever stiffness adjusting screw
Turn this screw with a miniature Phillips screwdriver to adjust the fader lever stiffness. Turn clockwise to make the fader lever harder to move, and counterclockwise to make it easier to move.

⓭ Transition indicator
This indicator consisting of 20 LEDs shows the progress of an effect transition.

4 Pattern/numeric keypad

This is used for effect pattern selection, transition time setting, and other data entry.



❶ PATTERN NUMBER display window
This shows an effect pattern number.
While you are entering a pattern number, the dot at the lower right of each numeral lights.

❷ SET button
Press this button, turning it on, to enter the pattern number specification mode. In this mode, you can use the PATTERN/KEY PAD buttons to specify an effect pattern number.
Press this button once more, turning it off, to return to the direct pattern selection mode.

❸ DIRECT RECALL button
Press this button, turning it on, to enter the direct recall mode. In this mode, pressing one of the PATTERN/KEY PAD buttons 0 to 9 recalls the corresponding snapshot 0 to 9.

❹ DIRECT PATTERN button
Press this button, turning it on, to enter the direct pattern selection mode. In this mode, you can use the PATTERN/KEY PAD buttons (0 to 9 and P IN P/RST) to directly select the assigned effect patterns. When the system is powered on, and after exiting any other operating mode, it automatically switches to direct pattern selection mode.

❺ PATTERN/KEY PAD buttons

These function as shown in the following table, according to the selected mode.

Changing labels

You can change the labels on the buttons, using the supplied labels.

For details of how to change the labels, see page A-63.

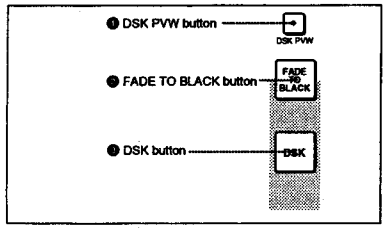
Functions of the PATTERN/KEY PAD buttons

Button	Mode					
	DIRECT PATTERN	PATTERN	TRANS	USER PGM	SNAP SHOT	DIRECT RECALL
0 to 9	Select the pattern shown on the button.a)	Set the pattern number.	Set the transition time.	–	Specify a snapshot number.	Recall one of snapshots 0 to 9.
LAST X/INS	–	–	–	Add a key frame.	Return to the state before recalling a snapshot. (Press LAST X while holding down the ENTER button.)	Return to the state before recalling a snapshot. (Press LAST X while holding down the ENTER button.)
DEL	–	Delete the last character entered.	Delete the last character entered.	Delete a key frame.	Delete the last character entered.	–
P IN P/RST	Select the pattern shown on the button.a)	Reset the input value.	Reset the input value.	Initialize the parameters.	Reset the input value.	–
UP	Increment the pattern number.	Increment the pattern number.	Increment the transition time by one frame.	Increment the key frame number.	Increment the snapshot number.	Increment the snapshot number.
DOWN	Decrement the pattern number.	Decrement the pattern number.	Decrement the transition time by one frame.	Decrement the key frame number.	Decrement the snapshot number.	Decrement the snapshot number.
ENTER	–	Confirm the input value.	Confirm the input value.	Change the key frame.	Confirm the input value.	Return to the state before recalling a snapshot. (Press LAST X while holding down the ENTER button.)

–: Not used

a) For the pattern allocation, see pages 3-18 to 3-20.

5 Fade-to-black and DSK section



❶ DSK PVW (downstream keyer preview) button

When this button is pressed, turning it on, the program output video is output from the preview output connectors with the downstream key inserted.

❷ FADE TO BLACK button

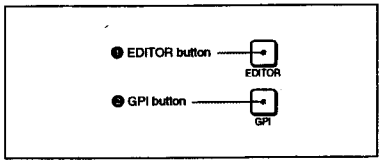
Press this button, turning it on, to change the entire program output video to a preset color (factory default: black). To set the color, press the MATTES button in the menu control section, and display the setting menu in the effect control section ((F1) SELECT-FTB).

By pressing the SET button in the effect transition section, you can set the fade-to-black transition time.

❸ DSK (downstream keyer) button

Press this button, turning it on, to insert the downstream key set by the DSK section buttons in the menu control section into the program output video. By pressing the SET button in the effect transition section, you can set the downstream key transition time.

6 EDITOR and GPI buttons



❶ EDITOR button

Press this button, turning it on, to accept control from an external editor connected to the EDITOR connector on the rear panel of the processor unit.
Press this button once again to turn it off; control is no longer accepted from the external editor.

❷ GPI button

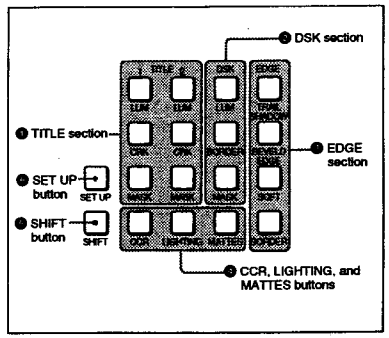
Press this button, turning it on, to accept GPI signals input to the GPI/T 1 and 2 connectors on the rear panel of the processor unit.
Press this button once again to turn it off; GPI signals are no longer accepted.

7 Menu control section

For various effect settings, you press a particular button in the menu control section, to display a setting menu in the effect control section. Some buttons toggle on and off when pressed: in this case the corresponding effect is disabled when the button is off.

Displaying the menu for a button already lit

Hold down the SHIFT button and press the button again. This leaves the button lit (and the effect enabled), while bringing up the menu in the effect control section. For the LUM and CRK buttons in the TITLE section, it is not necessary to hold down the SHIFT button.



❶ TITLE section

The title key function allows you to superimpose characters or graphics by cutting out part of the foreground video with a key source signal, and applying the effect to the background video.
There are two ways of using the key source signal: as a luminance key depending only on image intensity, or as a chroma key, based on a particular color.
Using the buttons in columns 1 and 2 of the TITLE section, you can insert two title keys (TITLE 2 requires the optional BKDF-711 board to be installed).
To insert a title key, press the TITLE button in the effect transition section.
The TITLE 1 and TITLE 2 buttons include the following.

CRK (chroma key) button: Press this to use a chroma key to cut out the image. When pressed, this button lights, and portions of the foreground image of the designated color are cut out as the key source signal. When this button is lit, the LUM button is off.
You can carry out chroma keying simply, using the auto chroma key function.

LUM (luminance) button: Press this to use a luminance key to cut out the image. When pressed, this button lights, and portions of the foreground image are cut out based on the luminance level. When this button is lit, the CRK button is off.

MASK button: Press this button to mask off a part of the key source signal. When you press this button, it lights, and the system is now in mask mode, and you can select a rectangular mask in the effect control section. Normally, the area outside the mask rectangle is the area which is masked. To invert the mask, so that the area inside the rectangle is masked, set INVERT (F5) to ON in the effect control section.
Press the button once more to turn it off and end mask mode.

❷ DSK (downstream keyer) section

Using a downstream key, you can add characters or graphics to an image to which an effect has already been applied. Unlike a title key, you can add this to an image with a foreground and background superimposed. To insert a downstream key, press the DSK button in the fade-to-black and DSK section.

LUM (luminance) button: Press this to display a menu in the effect control section for adding a key based on the luminance level of an input signal. In the effect control section you can select the input signal to the DSK KEY IN connector on the rear panel or the input signal selected by the DSK FILL button in the delegation section as the key source signal.

BORDER button: Press this button to apply a border to the characters and graphics inserted as a downstream key. When you press this button, it lights, and you can adjust the border settings in the effect control section.
Press the button once more to turn it off, and remove the border.

MASK button: Press this button to mask unwanted parts of the characters and graphics inserted as a downstream key. When you press this button, it lights, and the system is now in mask mode, and you can select a rectangular mask in the effect control section. Normally, the area outside the mask rectangle is the area which is masked. To invert the mask, so that the area inside the rectangle is masked, set INVERT (F5) to ON in the effect control section.
Press the button once more to turn it off and end mask mode.

❸ EDGE section

This controls the edge effects applied to the boundary between the foreground and background images.

TRAIL SHADOW button: Press this button to apply a trail, drop border, or shadow effect. When you press this button, it lights, and you can select and adjust the effect in the effect control section.
- **Trail:** The foreground pattern leaves a trail of afterimages.
- **Drop border:** This applies a border in the background of the foreground image.
- **Shadow:** This applies a shadow behind the foreground image.

Press the button once more to turn it off and remove the edge effect.

BEVELD (beveled) EDGE button: Press this button to apply a three-dimensional beveled effect to the boundary between the foreground and background images. When you press this button, it lights, and you can adjust the beveled edge settings in the effect control section.
Press the button once more to turn it off and remove the beveled edge effect.

SOFT button: Press this button to soften the boundary between the foreground and background images. When you press this button, it lights, and you can adjust the degree of softness in the effect control section.
Press the button once more to turn it off and remove the soft edge effect.

BORDER button: Press this button to apply a border to the boundary between the foreground and background images. When you press this button, it lights, and you can adjust the border settings in the effect control section.
Press the button once more to turn it off and remove the border.

Adjusting the cropping: To adjust the cropping, use the second page (CROP) of the adjustment menu for beveled edge, soft edge, or border.

❹ CCR, LIGHTING, and MATTES buttons

CCR (color corrector) button: Press this button to use the color corrector. When you press this button, it lights, and you can adjust the color corrector settings in the effect control section. Press the button once more to turn it off and exit the color corrector.

LIGHTING button: Press this button to apply lighting effects to the foreground image. When you press this button, it lights, and you can adjust the lighting settings in the effect control section. Press the button once more to turn it off and remove the lighting effect.

MATTES button: By pressing this button, you can carry out various matte adjustments, matte copies, and internal video signal selections in the effect control section.

❺ SHIFT button

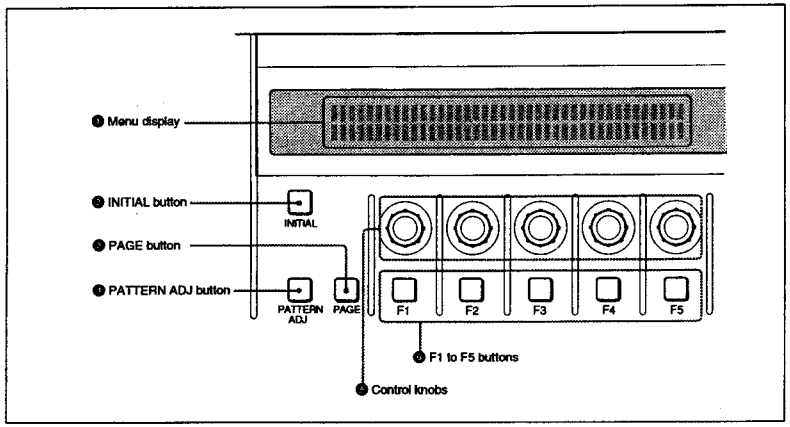
When a button in the menu control section is lit, but the corresponding menu is not displayed in the effect control section, hold down the SHIFT button and press the lit button. This brings up the menu, without interrupting the function selection, and leaving the button lit.
This applies to the following buttons:
- MASK buttons in the TITLE section
- BORDER and MASK buttons in the DSK section
- TRAIL SHADOW, BEVELD EDGE, SOFT, and BORDER buttons in the EDGE section
- CCR button and LIGHTING button

❻ SET UP button

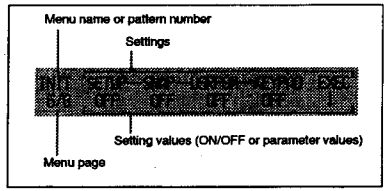
To access the setup menus for system and control panel settings, press this button. The setup menu appears in the effect control section.

Control Panel

8 Effect control section



❶ Menu display
This shows system and effect settings. Watch this display while checking and adjusting the settings.



❷ INITIAL button
This returns settings to their factory defaults.
- **To return a selected setting to its factory default**
  Hold down the INITIAL button, and press the corresponding F button (F1 to F5).
- **To return all settings on the selected page to their factory defaults**
  Hold down the INITIAL button, and press the PAGE button.
- **To return all settings on all pages of the currently selected menu to their factory defaults (not valid in setup menu or matte menu)**
  Hold down the INITIAL button, and press the PATTERN ADJ button.

❸ PAGE button
Press this button to move to the next page of a menu. Pressing this button on the last page of a menu returns to the first page.
Holding down the SHIFT button in the menu control section and pressing this button moves to the previous menu.

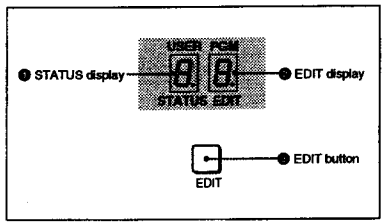
❹ PATTERN ADJ (adjust) button
Press this button to adjust the settings for the pattern number displayed in the PATTERN NUMBER display window.
This displays the settings for the pattern in the effect control section.

❺ Control knobs
These correspond to the five settings shown in the menu display. Turn the corresponding knob to adjust a setting.

❻ F1 to F5 buttons
These correspond to the five settings shown in the menu display.
Press the corresponding button to select a setting, or toggle it on and off.

- **Changing a setting value preceded by "+" (setup menu operations)**
  Hold down the corresponding F button (F1 to F5), and turn the control knob.
- **Changing a setting value followed by "+" (user program effect setting operations)**
  Hold down the corresponding F button (F1 to F5), and enter the numeric value using the numeric keypad.

9 User program section



❶ STATUS display
When a user program effect is selected, this shows the number of key frames comprising the effect. (Maximum 8)

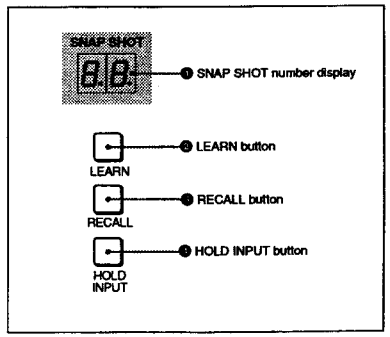
❷ EDIT display
In the user program edit mode, this shows the key frame number to which editing applies.

❸ EDIT button
Press this button to edit a user program effect. When you press this button, it lights, and the system enters the user program edit mode.
Press the button once more to turn it off and exit the user program edit mode.

Note

If you press the EDIT button when an effect other than a user program effect is selected, this does not switch to user program edit mode.

10 Snapshot section



❶ SNAP SHOT number display
This shows a snapshot number (0 to 99). While you are entering a number, the dot at the lower right of each numeral lights.

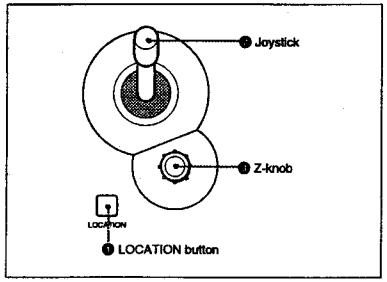
❷ LEARN button
Press this button to save the control panel settings as a snapshot (learn function).
When you press this button, it lights, and the system enters learn mode. Enter the snapshot number (0 to 99) from the numeric keypad, and press the ENTER button to save the control panel settings in the snapshot.

❸ RECALL button
Press this button to recall settings saved as a snapshot. When you press this button, it lights, and the system enters recall mode. Enter the snapshot number (0 to 99) from the numeric keypad, and press the ENTER button to recreate the control panel settings from the snapshot on the control panel.

Control Panel

❹ HOLD INPUT button
To hold the primary cross-point bus settings and the auxiliary bus settings (signal selections) fixed when recalling a snapshot, press this button. When you press this button, it lights, and when you recall a snapshot, the system is in the hold input mode. When you recall a snapshot in this mode, all settings are recreated on the control panel except those relating to the primary cross-point bus and the auxiliary bus.
Press the button once more to turn it off and exit the hold input mode.

11 Location section

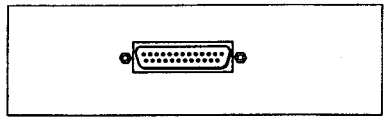


❶ LOCATION button
Press this button to use the joystick and Z-knob. When you press this button, it lights, and enables the joystick and Z-knob.
Press the button once more to disable the joystick and Z-knob, and return the effect pattern to its default position.
Holding down the INITIAL button while pressing this button returns the setting to its default value.

❷ Joystick
Use the joystick to position the effect pattern in the x- and y-directions.

❸ Z-knob
Turn the Z-knob to move an effect pattern in the depth direction (the z-axis). With this you can change the effective size of the pattern.

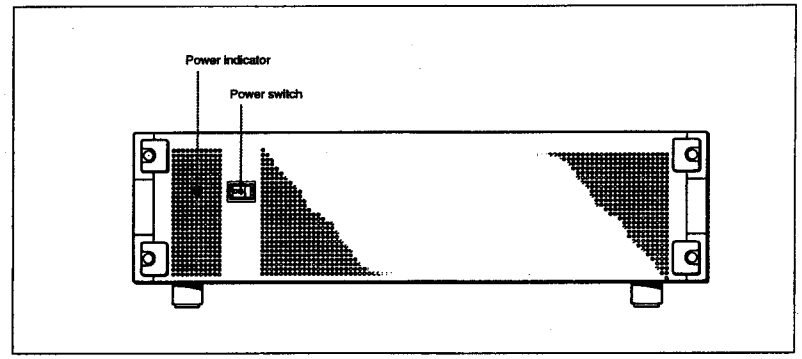
12 25-pin connector (rear panel)



Use the supplied 25-pin control cable to connect this to the PANEL connector on the processor unit.

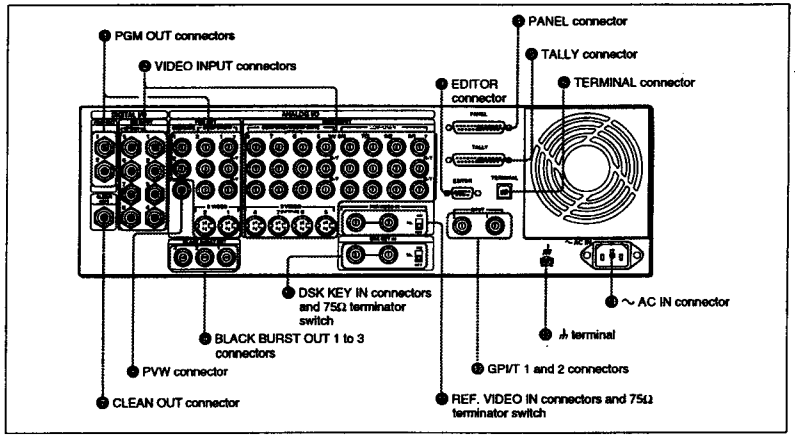
Processor Unit

Front Panel



Power switch and indicator
This powers the unit on and off. Press the "|" side of the switch to power on, and the "O" side to power off. When the power is on, the power indicator lights amber.

Rear Panel


❶ PGM OUT connectors
❷ VIDEO INPUT connectors
❸ PANEL connector
❹ TALLY connector
❺ EDITOR connector
❻ TERMINAL connector
❼ DSK KEY IN connectors and 75Ω terminator switch
❽ ~ AC IN connector
❾ ⏚ terminal
❿ BLACK BURST OUT 1 to 3 connectors
⓫ PVW connector
⓬ GPI/T 1 and 2 connectors
⓭ CLEAN OUT connector
⓮ REF. VIDEO IN connectors and 75Ω terminator switch

Processor Unit

❶ PGM OUT (program output) connectors
These output the final program output, that is, the video to which effects have been applied. Connect to VTR (recorder) and program monitor video input connectors. The following four types of output are provided, each with two channels (1 and 2).
SDI (BNC): Output serial digital signals (270 MHz).
COMPOSITE (BNC): Output composite video signals.
COMPONENT (BNC): Output Betacam format component video signals (Y, R–Y, B–Y).
S VIDEO (4-pin): Output S-video (Y/C separation) signals.
You can use all four formats simultaneously. The same signals are output from connectors 1 and 2.

❷ VIDEO INPUT connectors
These input video camera and VTR (player) video signals. The connectors are in four groups, as follows.
- SDI INPUT 1 to 4, (OPTION) 5 to 8 (BNC)
- COMPONENT 5/1, 6/2, 7/3, 8/4 (BNC)
- COMPONENT/COMPOSITE (OPTION) 5 to 8 (BNC)
- S VIDEO (OPTION) 5 to 8 (4-pin)

SDI INPUT 1 to 4, (OPTION) 5 to 8 (BNC-type)
Input serial digital signals (270 MHz).
Connectors 5 to 8 can only be used when the optional BKDF-701 SDI and Component Input Board is installed.
The input signals to these connectors must be synchronized to this unit.

COMPONENT 5/1, 6/2, 7/3, 8/4 (BNC-type)
Input Betacam format component video signals.
Y: Input the luminance (Y) signal.
R–Y: Input the R–Y color difference signal.
B–Y: Input the B–Y color difference signal.
The input signals to these connectors must be synchronized to this unit. Therefore, when inputing from a VTR, the signal must come through a time base corrector.
The 8/4 column of connectors can be changed to RGB input connectors by a setup menu operation. In this case, connect G (with sync), R, and B signals to Y, R–Y, and B–Y respectively.

When the optional BKDF-702/702P Y/C and Composite Input Board is installed, you can select in the setup menu whether to use the 5/1, 6/2, 7/3, and 8/4 connectors for component inputs 5 to 8 or component inputs 1 to 4.

COMPONENT/COMPOSITE (OPTION) 5 to 8 (BNC-type)
These connectors can be used by installing either of the optional BKDF-701 and BKDF-702/702P boards. When the BKDF-701 board is installed, connect Betacam format component video signals. When the BKDF-702/702P board is installed, connect composite video signals. The signals can be input from a VTR with no time base corrector. When using the BKDF-701 to input signals from a VTR, they must come through a time base corrector.

Connector	Input signal for BKDF-701	Input signal for BKDF-702/702P
Y/V	Luminance (Y) signal	Composite signal
R–Y	Color difference signal (R–Y)	Not used
B–Y	Color difference signal (B–Y)	Not used

S VIDEO (OPTION) 5 to 8 (4-pin)
Input S-video (Y/C separation) signals. These connectors can only be used when the optional BKDF-702/702P board is installed. The signals can be input from a VTR with no time base corrector.

❸ EDITOR connector (9-pin)
Use this connector when controlling this unit with an editor (PVE-500, BVE-2000 series, or other editing control unit). Using an optional 9-pin remote control cable, connect to the 9-pin control connector of the editor.

❹ PANEL connector (25-pin)
With the supplied 25-pin control cable, connect to the 25-pin connector of the control panel.

❺ TALLY connector (25-pin)
Tally signals are output from this connector when the signal input to a VIDEO INPUT connector is selected on the control panel. Connect to the input signal sources (video cameras etc.). The outputs are relay contact signals, with a capacity of 200 mA / 30 V.

❻ TERMINAL connector (USB type B)
This is a USB interface connector. Use it when connecting to a computer for a software version upgrade.

❼ CLEAN OUT connector (BNC-type)
Outputs serial digital signals (270 MHz). Using the setup menu, you can select the output from the following three signals.
CLEAN OUT: The program output signal, without the downstream key inserted.
PVW OUT: The signal output is the same as the program output after completion of the effect transition. The title area can also be shown.
KEY OUT: This outputs a key signal corresponding to the shape of a selected effect. Use it as the key source input to another device.

❽ PVW (preview) connector (BNC-type)
This is an analog composite preview output. The signal output is the same as the program output after completion of the effect transition. It is not possible to include the title area.

❾ BLACK BURST OUT 1 to 3 connectors (BNC-type)
These output the black burst signals generated by the synchronizing signal generator internal to this unit. When an external synchronizing signal is input to the REF. VIDEO IN connectors, the black burst signal output is locked to the external synchronizing signal. Use the output from these connectors as a reference synchronizing signal when synchronizing input signal sources (character generators, etc.), or when synchronizing this unit with a VTR or editor to improve the precision of editing.

❿ DSK (downstream keyer) KEY IN connectors (BNC-type) and 75 Ω terminator switch
Input the key source signal for a downstream key, from a character generator or other device.
When the 75 Ω terminator switch is in the OFF position, the connectors provide a loop-through connection; with the key signal input to one connector, the other provides the same key source signal to another device. By connecting to an analog component Y connector on this unit, you can use it as a title key source.
When not using the loop-through output, the 75 Ω terminatior switch must be in the ON position.

⓫ REF. (reference) VIDEO IN connectors (BNC-type) and 75Ω terminator switch
When using this unit synchronized to an external signal, input the external reference signal (black burst). When the 75Ω terminatior switch is in the OFF position, the connectors provide a loop-through connection; with the reference signal input to one connector, the other provides the same reference signal for another device. When not using the loop-through output, the 75Ω terminatior switch must be in the ON position.

⓬ GPI/T (GPI/trigger) 1 and 2 connectors (BNC-type)
Input external trigger signals. These are used when controlling editing with GPI signals or an editor (BVE-600).

⓭ ⏚ (ground) terminal
Connect this to ground as required.

⓮ ∼ AC IN connector
With the supplied power cord, connect to the AC supply.

Chapter 3

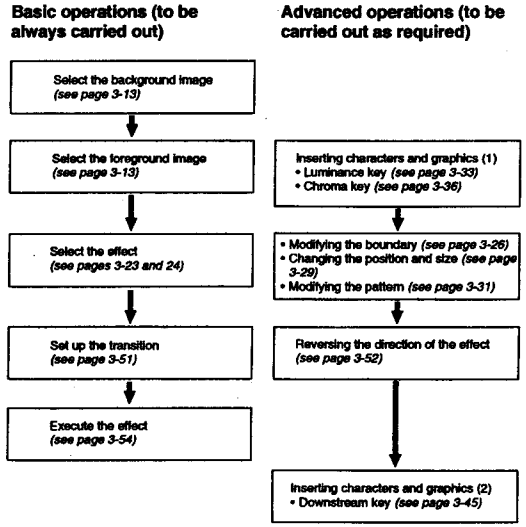
Basic Operation

DME Switcher Introduction

This section selects two of the many effects provided by the DFS-700/700P as examples, and describes the basic flow of operations to use them. It also describes the demonstration function, which automatically executes one hundred sample effects.

Sequence of Operations

The flow charts below show the general sequence of operations when using a DME switcher.


Basic operations (to be always carried out)
Advanced operations (to be carried out as required)
Select the background image (see page 3-13)
Select the foreground image (see page 3-13)
Select the effect (see pages 3-23 and 24)
Set up the transition (see page 3-51)
Execute the effect (see page 3-54)
Inserting characters and graphics (1)
• Luminance key (see page 3-33)
• Chroma key (see page 3-36)
• Modifying the boundary (see page 3-26)
• Changing the position and size (see page 3-29)
• Modifying the pattern (see page 3-31)
Reversing the direction of the effect (see page 3-52)
Inserting characters and graphics (2)
• Downstream key (see page 3-45)

DME Switcher Introduction

Example Operation (1): Wipe

In this example we'll use the AUTO TRANS button, to make a wipe, with the new image appearing from the center of the screen.

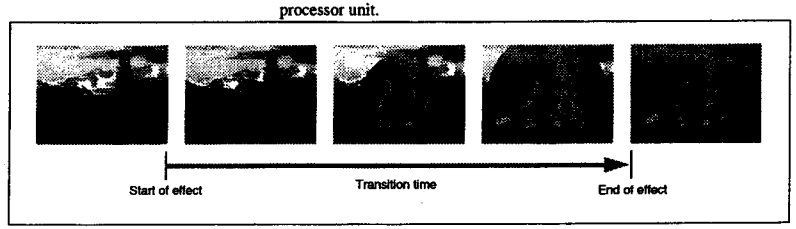
Setting items

As an example, we'll set the control panel as follows.

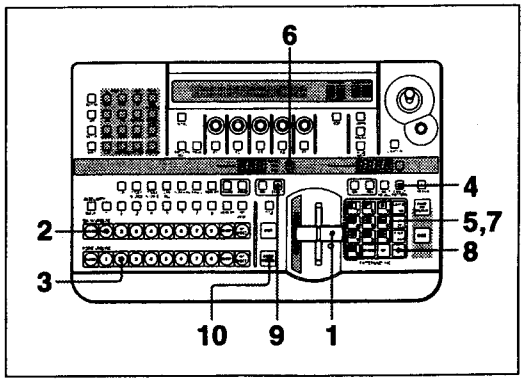
Background image (the image output before the transition): video signal connected to the VIDEO INPUT 1 connector
Foreground image (the image output after the transition): video signal connected to the VIDEO INPUT 2 connector
Effect: wipe (pattern number 24)
Transition time: 30 frames

Program output

Executing the above effect produces the following changes in the output on a program monitor connected to the PGM OUT connector of the processor unit.



Procedure



<Preparation>

1 Pull the fader lever toward you as far as it will go.

<Image selection>

2 Press BACKGROUND Bus button 1.

The pressed button lights red, and the video signal connected to the VIDEO INPUT 1 connector is selected as the background image. The selected background image appears on the program monitor.

3 Press FOREGROUND Bus button 2.

The pressed button lights amber, and the video signal connected to the VIDEO INPUT 2 connector is selected as the foreground image.
To check the selected image on the program monitor, move the fader lever to the opposite end. After checking, return the lever to the position closest to you.
If a preview monitor is connected, the selected foreground image appears in the preview monitor.

<Effect selection>

4 Press the DIRECT PATTERN button, turning it on.
(If it is already lit, omit this step.)

The unit is now in direct pattern selection mode. In this mode, you can select the eleven patterns assigned to buttons in the pattern/numeric keypad using the corresponding button.

(Continued)

5 Press button 9 in the pattern/numeric keypad.

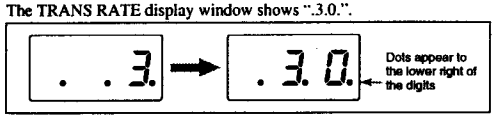
The button lights, and this selects the wipe assigned to this button (pattern number 24). The PATTERN NUMBER display window shows "0024".

<Transition time setting>

6 Press the SET button once or twice. so that the EFFECT display window mode indicator lights.
(If it is already lit, omit this step.)

7 In the pattern/numeric keypad, press buttons 3 and 0 in that order.

The TRANS RATE display window shows ".3.0.".



8 Press the ENTER button.

The dots to the lower right of the digits disappear, and the value entered in step **7** is set as the transition time.

9 Press the EFFECT button. turning it on.
(If it is already lit, omit this step.)

10 Press the AUTO TRANS button.

The wipe is carried out over 30 frames. switching from the background image to the foreground image.
When the transition completes, BACKGROUND bus button 2 is lit red. and FOREGROUND bus button 1 is lit amber. This indicates that as a result of the transition, the video signal connected to the VIDEO INPUT 2 connector is automatically selected as the background image, and the video signal connected to the VIDEO INPUT 1 connector as the foreground image.

Example Operation (2): Picture-in-Picture

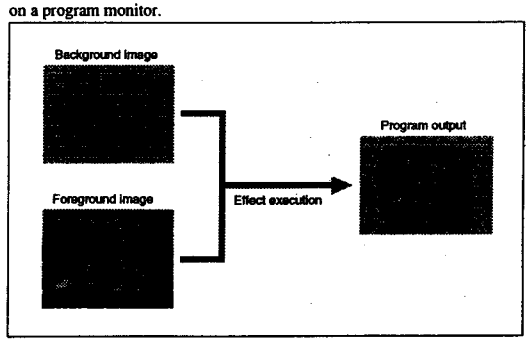
Using the fader lever, we'll insert the foreground image within the background image.
We'll apply a border around the edge of the foreground image.

Setting items

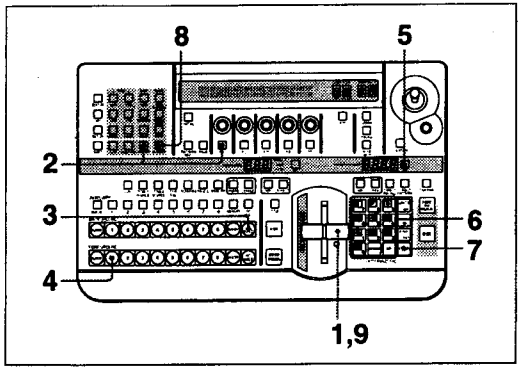
As an example, we'll set the control panel as follows.
Background image: internal video signal (color background)
Foreground image: video signal connected to the VIDEO INPUT 1 connector
Effect: picture-in-picture (pattern number 1100)
Border: ON

Program output

Executing the above effect produces the following changes in the output on a program monitor.



Procedure



<Preparation>

1 Pull the fader lever toward you as far as it will go.

<Image selection>

2 Press the MATTES button in the menu control section, and display page 1 of the MATTE menu, then with the F1(SELECT) button select "INT V".

MATTE	SELECT	Lum	Sat	Hue	CH2BRD
1/2	INT V	0-100	0-100	0-99	BRDMAT
PAGE	F1	F2	F3	F4	F5

You can change the color of matte color and embossing pattern. For details, see the section "Adjusting Color Mattes" (page 3-57).

3 Press the BACKGROUND bus INT VIDEO button.

The pressed button lights red, and a color matte is selected as the background image.

4 Press the FOREGROUND bus button 1.

The pressed button lights amber, and the video signal connected to the VIDEO INPUT 1 connector is selected as the foreground image.

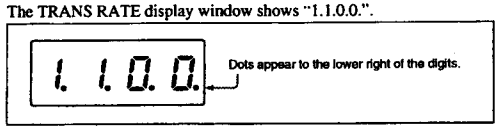
<Effect selection>

5 Press the SET button to the right of the PATTERN NUMBER display window, turning it on.
(If it is already lit, omit this step.)

<Border settings>

6 In the numeric keypad, press buttons 1, 1, 0, 0, in that order.

The TRANS RATE display window shows "1.1.0.0.".



7 Press the ENTER button.

The dots to the lower right of the digits disappear, and picture-in-picture, or pattern number 1100, is selected.

8 In the menu control section, press the BORDER button.

The button lights, enabling the border.

You can change the color and width of the border. For details, see the section "Modifying the Boundary" (page 3-26).

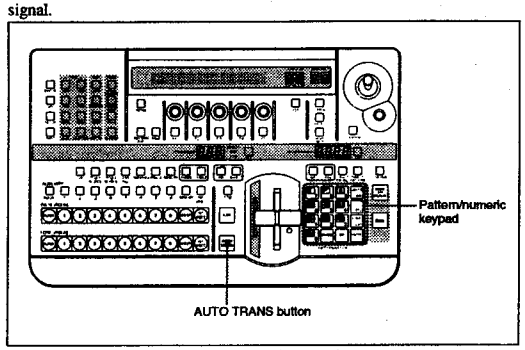
<Effect execution>

9 Move the fader lever to the opposite end.

Both the BACKGROUND bus INT VIDEO button and the FOREGROUND bus button 1 light red.
As you move the lever, the picture-in-picture effect takes place, and a foreground image with a border is inserted into the background image.

Demonstration

The DFS-700/700P is equipped with a demonstration function, which automatically plays back one hundred effects stored in ROM in the processor unit.
The effects (which by factory default are snapshots 0 to 99) have been chosen to demonstrate the features of the DFS-700/700P as effectively as possible.
For maximum effect, the demonstration function uses the signals connected to VIDEO INPUT connectors 1 and 2, and the internal video signal.



Buttons used for the demonstration

To start the demonstration

In the pattern/numeric keypad, hold down buttons 1 and 9, and press the AUTO TRANS button.
The one hundred effects stored in ROM are played back continuously, and repeated until you press the AUTO TRANS button once more. During the demonstration, the buttons on the pattern/numeric keypad light in turn in the clockwise direction.
During the demonstration, the control panel does not accept any operations other than pressing the AUTO TRANS button.

Demonstration with user-registered snapshots

It is also possible to have a demonstration with user-registered snapshots. In this case, hold down buttons 3 and 7 in the pattern/numeric keypad, and press the AUTO TRANS button. During the demonstration, the buttons on the pattern/numeric keypad light in turn in the counterclockwise direction.

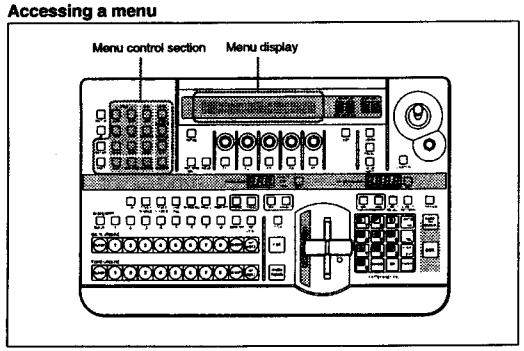
To end the demonstration

Press the AUTO TRANS button once more.
The demonstration ends, and the control panel settings are those of the last effect in the demonstration.

Using the Menus

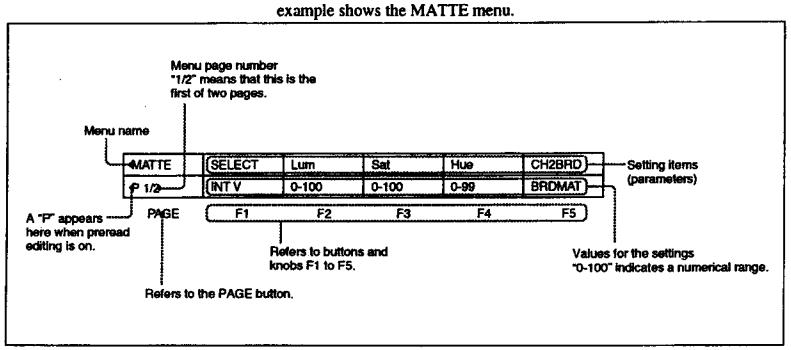
This unit incorporates menus for various effect settings and internal color matte settings, and also a setup menu for system settings.
This section describes the basic menu operation.

Accessing a menu



Press one of the buttons in the menu control section.
For example, to recall the menu for internal color matte settings, press the MATTES button in the menu control section. The MATTE menu appears in the menu display in the effect control section.

In this manual, menus are shown in a tabular format. The following example shows the MATTE menu.



Changing settings

- For settings with values shown in letters, press the corresponding one of buttons F1 to F5.
  In the text, this is shown as "the F1(SELECT) button," with the setting name after the button name F1 to F5.
- To change a setting with a numerical value, turn the corresponding one of control knobs F1 to F5.
  In the text, this is shown as "the F2(Lum) knob," with the setting name after the knob name F1 to F5.
- In the setup menu, when an item has a plus sign in front, hold down the F button (F4 or F5) and turn the corresponding knob.
  For example, in page 3/8 of the setup menu, to change the setting for F4 [+H-pos], hold down the F4 button and turn the F4 knob.

To change the menu page

Press the PAGE button.

Buttons of the menu control section which light when pressed

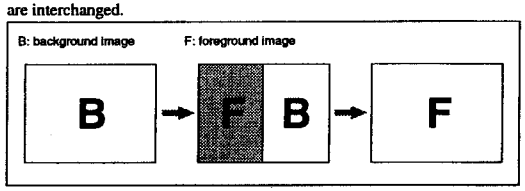
When you press one of these buttons, it lights, and the settings in the menu recalled by the button are reflected in the monitor display. To avoid this. for example just to check the settings in a menu, hold down the SHIFT button while pressing the menu button.

Selecting Images

Background Image and Foreground Image

Background and foreground in a transition effect

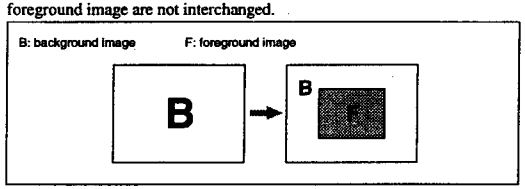
In a transition from one image to another, the old image is referred to as the "background image". The new image, which replaces the old image, is referred to as the "foreground image".
When a transition completes, the background image and foreground image are interchanged.



Example transition effect: wipe

Background and foreground in an animation effect

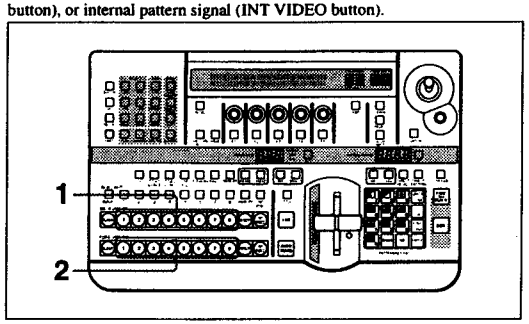
In an animation effect, in which an effect pattern is inserted in the image or moved about on the image, the background image is the background to the effect, and the inserted effect is referred to as the "foreground image".
When an animation effect completes, the background image and foreground image are not interchanged.



Example animation effect: picture-in-picture

Selecting the background image and foreground image

As the background image and foreground image you can select any of the video signals connected to the VIDEO INPUT 1 to 8 connectors of the processor unit (corresponding to BACKGROUND/FOREGROUND bus buttons 1 to 8), a freeze frame stored in the frame memory (MEMORY button), or internal pattern signal (INT VIDEO button).



1 To select the background image, press one of BACKGROUND bus buttons 1 to 8.

The pressed button lights red.

2 To select the foreground image, press one of FOREGROUND bus buttons 1 to 8.

The pressed button lights amber.

Program output and lit button colors

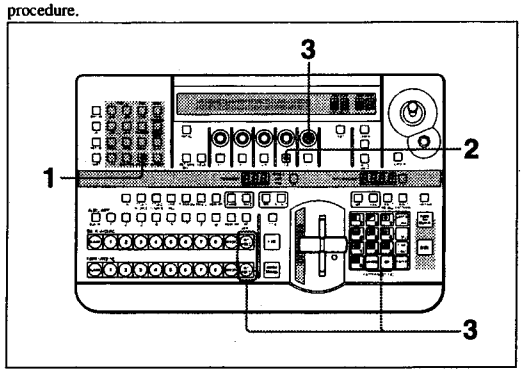
The BACKGROUND bus buttons and FOREGROUND bus buttons light in two colors, depending on whether or not the corresponding image is present in the current program monitor output (on a video monitor connected to the PGM OUT connector).

- **A button lights red** when the image is present in the program monitor output.
- **A button lights amber** when the image is not present in the program monitor output.

Selecting Images

Switching the internal video signal selected by the INT VIDEO button

To switch the internal video signal selected by pressing the INT VIDEO button on either the background bus or foreground bus, use the following procedure.



1 Press the MATTES button in the menu control section.

Page 1 of the MATTE menu appears.

2 Press the PAGE button in the effect control section. to display page 2 of the MATTE menu. then press the F4(INTVID) button to select the desired signal.

MATTE	FROM	TO	COPY	INTVID	PTN
2/2	INT V	BORD	EXEC	Matte	1-80
PAGE	F1	F2	F3	F4	F5

You can select any of the following three possibilities.

Matte: color background signal. In the following step **3**. you can select any of plain, or 79 different embossed patterns.

You can adjust the color of the color background signal as desired. For details. see the section "Adjusting Color Mattes" (page 3-57).

Bar: color bars

Grid: a grid pattern

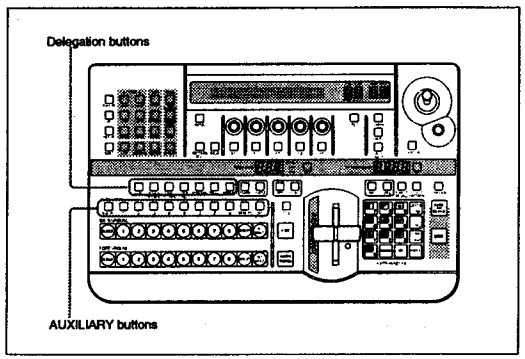
3 If you have selected a color background signal carry out either of the following.

- Hold down the INT VIDEO button in the background bus or foreground bus, and in the pattern/numeric keypad press the UP or DOWN button.
  Each time you press. the pattern changes, and the new pattern appears on the program monitor.
- Turn the F5(PTN) knob.

Previewing the image after an effect is executed

Select the background image and foreground image, and set up the effect, then move the fader lever to the opposite end.
You can now check on the program monitor the result of carrying out the currently set effect.
If a preview monitor is connected, you can check the foreground image on the preview monitor.

Selecting Signals Output to the Auxiliary Bus



To select the signal to be output to the auxiliary bus, press the desired AUXILIARY button (BLACK, 1 to 8, MEMORY, or INT VIDEO), turning it on.

To specify the function for which the selected signal is used, press one of the delegation buttons, turning it on.

CCR button: use for color correction.
TITLE 1 SOURCE button: use as the key source signal for title key 1.
TITLE 2 SOURCE button: use as the key source signal for title key 2.
DSK FILL button: use as key fill for the downstream keyer.
SUPER BG button: use as background for 3D effects, two-channel DME effects and so on.
FRGD 2 button: use as the second foreground channel for 3D effects, two-channel DME effects and so on.
MEMORY button: capture in frame memory.

Selecting an Effect

This section describes the types of effects you can use on this system, and how to select an effect.

Types of Effect

The DFS-700/700P has more than 450 built-in effect patterns provided as standard.
Each pattern is identified by a number, and the patterns are grouped together under headings such as "wipe" and "picture-in-picture".

Transition effects and animation effects

Effects are broadly divided into transition effects and animation effects.

Transition effects: in these effects the background image is completely replaced by the foreground image. When the effect completes, the colors in which the BACKGROUND and FOREGROUND bus buttons are lit become the reverse of those before the effect.

Animation effects: in these effects, for example, the foreground image is inserted in the background image, and moved around. The foreground image does not completely replace the background image, and the colors in which the BACKGROUND and FOREGROUND bus buttons are lit stay the same.

For the differences between transition and animation effects, see the section "Background Image and Foreground Image" (page 3-12).

Modifications to effects

Depending on the effect pattern, the following modifications can be added.

- You can add a border to the boundary between the background image and foreground image, or blur the boundary.
- You can change the pattern position and size.

For details of the modifications that can be applied to the effect patterns, see the section "Effect Pattern Variant Forms and Decorations" (page A-22).

- You can change a pattern by changing its parameters. (Effects which can be changed by setting parameters are referred to as "user modifiable effects".)

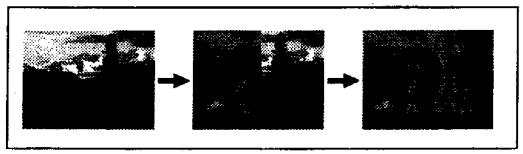
Selecting an Effect

Example Effects

This section shows as examples the effect patterns ("direct patterns") which you can access simply by pressing a button in the pattern/numeric keypad. Note that the effect patterns shown below are the factory default assignments, and you can change the patterns assigned to buttons 0 to 9 and P IN P/RST.

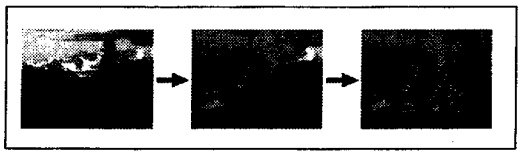
For details of how to change the assignments, see the section "Changing Direct Pattern Assignments" (page 4-1).

7
Pattern number: 1
Effect type: wipe
Motion type: transition



The foreground image appears from the left, and wipes over the background image to the right.

8
Pattern number: 9
Effect type: wipe
Motion type: transition

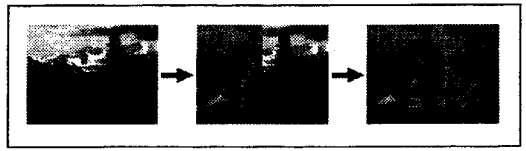


The foreground image appears from the upper left corner, and wipes over the background image to the lower right.

9
Pattern number: 24
Effect type: wipe
Motion type: transition

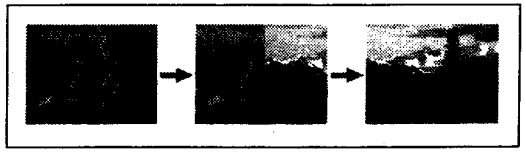
The foreground image appears as a circle in the center of the image, and this circle grows, wiping over the background image.

4
Pattern number: 700
Effect type: matrix wipe
Motion type: transition



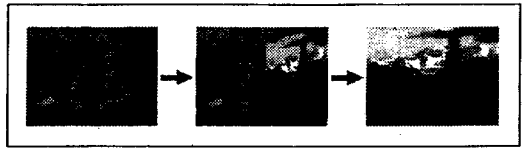
The foreground image appears in the upper left corner, and fills the screen in a series of vertical strips.

5
Pattern number: 1300
Effect type: slide
Motion type: transition



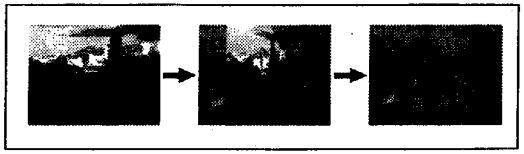
The foreground image appears from the right, and slides over the background image to the left.

6
Pattern number: 1700
Effect type: 3D rotation
Motion type: transition



The foreground image appears as a door rotating toward the viewer to close, and covers the background. When the door is completely closed, the foreground fills the screen.

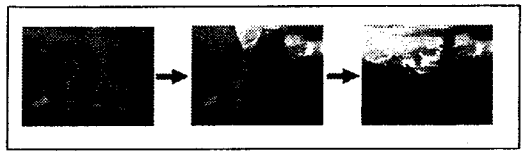
1
Pattern number: 1902
Effect type: flip
Motion type: transition



The image rotates about a vertical axis as though a panel with the background on one side. When the panel reaches 90 degrees to the plane of the screen, the foreground image appears on the other side, and completely fills the screen when the transition ends.

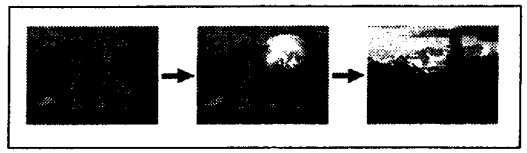
Selecting an Effect

Pattern number: 2100
Effect type: page turn
Motion type: transition



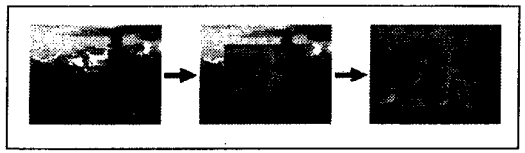
The foreground image appears as though progressively covering the background image.

Pattern number: 2200
Effect type: sphere
Motion type: transition



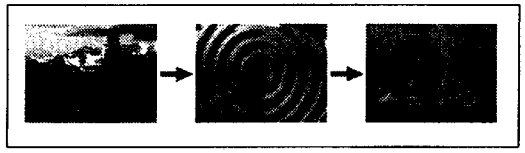
The foreground image appears in a ball shape in the upper right. It "bounces" on the bottom of the screen, then when it reaches the top, turns into a plane and fills the screen, covering the background image.

Pattern number: 1100
Effect type: picture-in-picture
Motion type: animation



The foreground image appears in the center as a rectangle, of the same aspect ratio as the screen, and grows larger until it covers the background image.

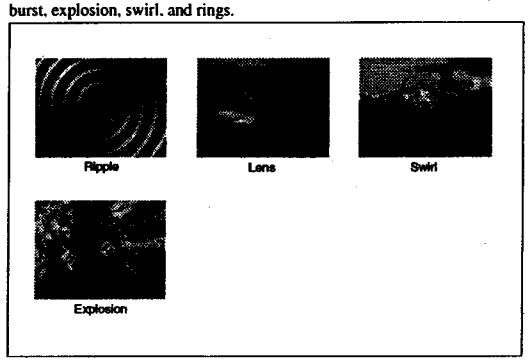
Pattern number: 2260
Effect type: ripple
Motion type: transition



The foreground image appears as from within the ripples, finally covering the whole screen with no movement.

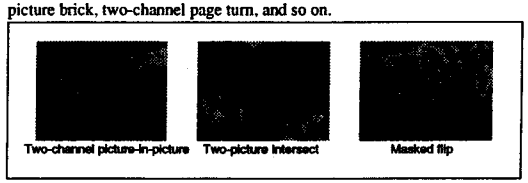
Nonlinear effects

These effects include effects such as ripples, under names such as lens, burst, explosion, swirl, and rings.



Two-channel DME effects

These effects combine two foreground images with the background image. They include two-channel picture-in-picture, two-picture intersect, two-picture brick, two-channel page turn, and so on.



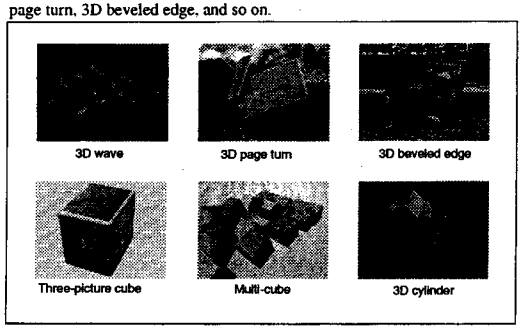
Note

To use two-channel DME effects requires the optional BKDF-711 2nd Channel DME Board.

Selecting an Effect

3D mapping effects

These effects use nonlinear image processing techniques. They include 3D page turn, 3D beveled edge, and so on.



Note

Using 3D mapping effects requires the optional BKDF-712 3D Video Mapping Effects Board.
Using the three-picture cube effect also requires the optional BKDF-711 2nd Channel DME Board.

Selection in Direct Pattern Selection Mode

In the direct pattern selection mode, pressing any button (other than INS, DEL, UP, DOWN, or ENTER) in the pattern/numeric keypad directly selects an effect pattern.

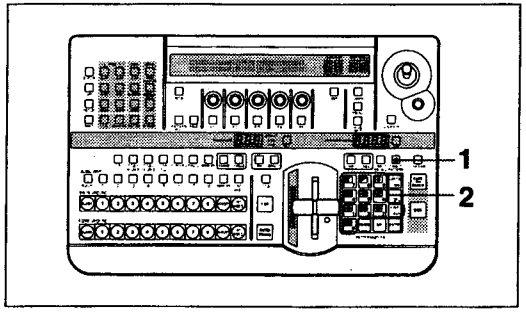
For details of the effects assigned by factory default to the buttons in the pattern/numeric keypad, see the previous section "Example Effects" (page 3-18).

Procedure

To select an effect pattern in the direct pattern selection mode, use the following procedure.

Note

If the EDIT button in the user program section (*see page 2-11*) is lit, first press it, turning it off.



1 Press the DIRECT PATTERN button, turning it on.

The unit is now in direct pattern selection mode.

2 In the pattern/numeric keypad, press the button assigned to the desired effect pattern, turning it on.

This selects the effect assigned to the button, and the pattern number appears in the PATTERN NUMBER display window.

Selection in Pattern Number Specification Mode

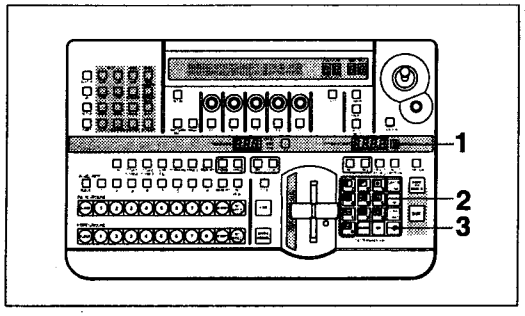
In the pattern number specification mode, you select the desired effect pattern by entering the number.

Procedure

To select an effect pattern in the pattern number specification mode, use the following procedure.

Note

If the EDIT button in the user program section (*see page 2-11*) is lit, first press it, turning it off.



1 Press the SET button, turning it on.

2 Enter the desired pattern number using buttons 0 to 9 on the pattern/numeric keypad.

The number you entered appears in the PATTERN NUMBER display window. Dots appear at the lower right of each digit, indicating that the entry is not yet confirmed.

3 Press the ENTER button.

The dots to the lower right of the digits in the PATTERN NUMBER display window disappear, confirming the pattern number.

If you enter a wrong number

Before pressing the ENTER button press the P IN P/RST button to cancel the wrong number, then enter the correct number.

Note

If you enter an invalid number (a number with no corresponding pattern), this is automatically corrected to the closest valid number larger than the number you entered. However, if you enter a number larger than 9309 this is corrected to pattern number 0001.

Adjusting the number before confirming

To increment the number by one, press the UP button. Hold down the UP button to increase the number continuously.
To decrement the number by one, press the DOWN button. Hold down the DOWN button to decrease the number continuously.

Modifying the Boundary — Border, Soft Edge, Beveled Edge, and Crop

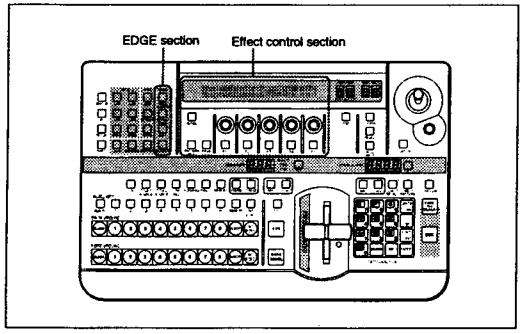
You can apply a border to the boundary between the foreground image and background image, or mask unwanted parts of the image.
There are four effects for modifying the boundary, as follows. You can use all four simultaneously.

Border: apply a border to the image boundary.
Soft edge: blur the image boundary.
Beveled edge: apply a bevel to the image boundary.
Crop: adjust the image boundary position, to eliminate unwanted parts. (For picture-in-picture and other effects in which a reduced image is used, reduce noise on the periphery of the image.)

Note

Depending on the effect pattern, you may not be able to apply the above effects. For details, see the section "Effect Pattern Variant Forms and Decorations" (*page A-22*).

Procedure



Controls used in modifying the boundary

To apply a border

Use the following procedure.

1 Press the BORDER button in the EDGE section, turning it on, and display page 1 of the EDGE menu.

EDGE	Border	Soft	BvlWid	BVLTYP	BvlInt
1/2	0-100	0-100	–100-100	01-20	0-100
PAGE	F1	F2	F3	F4	F5

2 Turn the F1(Border) knob, to set the width of the border.

To blur the image boundary

Use the following procedure.

1 Press the SOFT button in the EDGE section, turning it on, and display page 1 of the EDGE menu.

EDGE	Border	Soft	BvlWid	BVLTYP	BvlInt
1/2	0-100	0-100	–100-100	01-20	0-100
PAGE	F1	F2	F3	F4	F5

2 Turn the F2(Soft) knob, to set the degree of boundary blurring.

To apply a beveled edge to the image boundary

Use the following procedure.

1 Press the BEVELD EDGE button in the EDGE section, turning it on, and display page 1 of the EDGE menu.

EDGE	Border	Soft	BvlWid	BVLTYP	BvlInt
1/2	0-100	0-100	–100-100	01-20	0-100
PAGE	F1	F2	F3	F4	F5

2 Turn knobs F3(BvlWid), F4(BVLTYP), and F5(BvlInt) to set the width, type, and contrast of the beveled edge.

To remove unwanted portions of the image

Use the following procedure.

1 Press any one of the BORDER, SOFT, and BEVELD EDGE buttons, turning it on, and display page 2 of the EDGE menu. (Press the PAGE button to change the page.)

EDGE	CROP	Left	Right	Top	Bottom
2/2	AUTO	–400-400	–400-400	–300-300	–300-300
PAGE	F1	F2	F3	F4	F5

2 To adjust the image boundary manually, press the F1(CROP) button to select "MANUAL".

3 Turn the F2(Left), F3(Right), F4(Top), F5(Bottom) knobs, to adjust the four sides of the image boundary.

Note

If in step **2** you set F1(CROP) to "AUTO", the automatic adjustment for the particular effect pattern is carried out. Selecting "OFF" disables the cropping.

When effect parameters are already adjusted

When parameters of a border, soft edge, beveled edge, or crop effect are already adjusted, simply pressing any one of the BORDER, SOFT, and BEVELD EDGE buttons in the EDGE section to turn it on allows you to apply the selected effects to the effect pattern.

Modifying the Boundary — Border, Soft Edge, Beveled Edge, and Crop

Indications in the EDGE menu with square brackets [ ]
The parameters in the EDGE menu for functions which are turned off appear in square brackets [ ].
For example, when the border function is off, when you display the EDGE menu the setting for Border appears in square brackets.
In this state the knob adjustment is still valid. When you press the BORDER button, turning the function on, the new setting is reflected accordingly.

Changing the Pattern Position and Size — Location (X)(Y)(Z)

You can adjust the position and size of an effect pattern when inserting a foreground image into the background image.

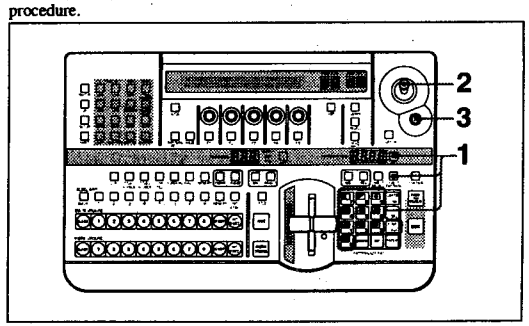
Note

For some effect patterns it is not possible to change their position and size. If pressing the LOCATION button does not turn it on, it means that one of those effect patterns is selected.

For details of whether position and size adjustment is possible for an effect, see the section "Effect Pattern Variant Forms and Decorations" (page A-22).

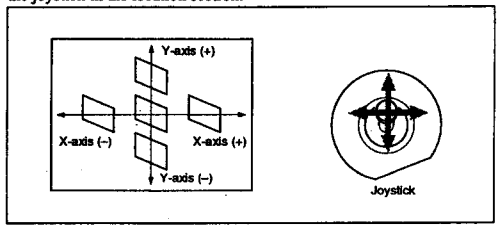
Procedure

To change the position and size of an effect pattern use the following procedure.



1 After checking in the section "Effect Pattern Variant Forms and Decorations" (*page A-22*), select an effect pattern for which it is possible to change the position and size.

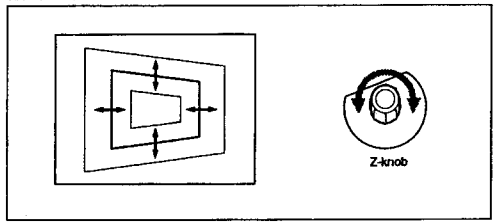
2 To move the pattern horizontally (x-axis) or vertically (y-axis), move the joystick in the location section.



(continued)

Changing the Pattern Position and Size — Location (X)(Y)(Z)

3 To move the pattern in the depth direction (z-axis), turn the Z-knob in the location section.



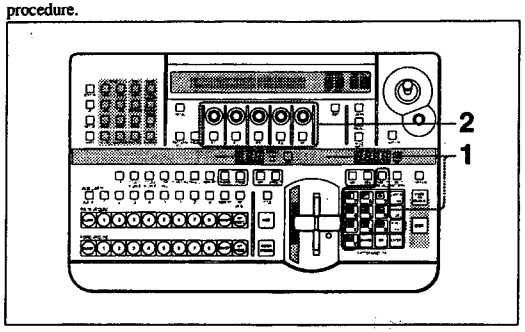
Modifying the Pattern — User Modifiable Effects

User modifiable effects are those effects for which you can modify the effect pattern by varying the parameters. The variable parameters vary from effect to effect.

For the pattern number of user modifiable effects, and the variable parameters, see the section "Effect Control Parameter List" (page A-5)

Procedure

To modify the effect pattern by varying the parameters, use the following procedure.



1 After checking in the section "Effect Control Parameter List" *(page A-5)*, select a user modifiable effect.

The variable parameters of the selected effect appear in the menu display.
If the selected effect has no variable parameters, the menu display shows a message "No Adjustable Parameter".

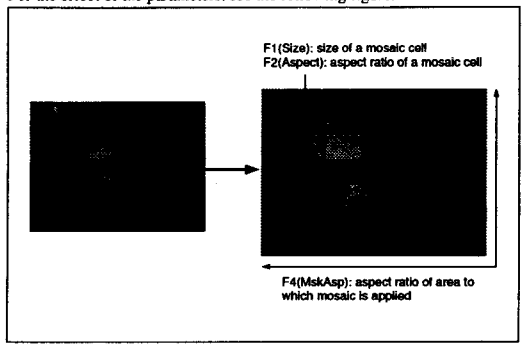
2 Using knobs and buttons F1 to F5, set the parameters.

Modifying the Pattern — User Modifiable Effects

Example of user modifiable effect parameters
As an example, if you select mosaic (pattern number 1016), the following parameters appear in the menu display.

1016	Size	Aspect	Soft	MskAsp	TYPE
1/1	0-100	0-100	0-100	0-100	FLAT
PAGE	F1	F2	F3	F4	F5

For the effect of the parameters, see the following figure.


F1(Size): size of a mosaic cell
F2(Aspect): aspect ratio of a mosaic cell
F4(MskAsp): aspect ratio of area to which mosaic is applied

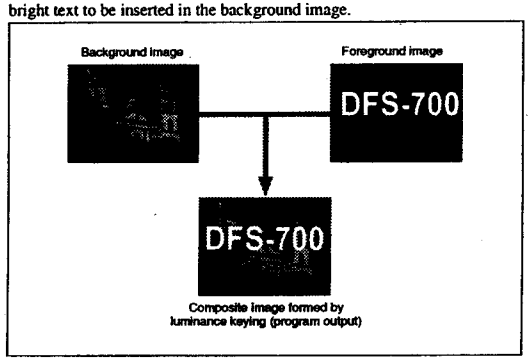
Parameters for mosaic (pattern number 1016)

Inserting Characters and Graphics (1) — Title Key

You can insert (or superimpose) text and graphics into the background image while applying effects. You can use either a luminance key or a chroma key for this insertion.

Luminance Key

In a luminance key, a certain luminance level in the foreground image is used as the threshold for creating the key signal, and the corresponding part of the foreground image is inserted into the background image. Normally the foreground image is on a black background, consisting of bright text to be inserted in the background image.

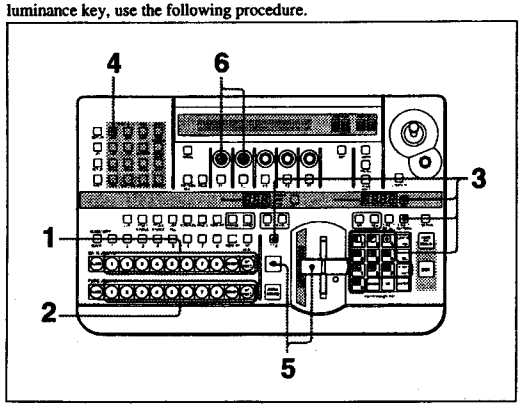


Two-channel luminance keying
With the optional 2nd Channel DME Board installed, you can also use a second luminance key channel.
When using two luminance keys, you must make both title 1 and title 2 settings in the TITLE section of the menu control section. Note that to select the foreground signal used for the second luminance key, in the delegation section press the FRGD 2 button, turning it on, then select the desired video signal with one of the AUXILIARY buttons.

Inserting Characters and Graphics (1) — Title Key

Procedure

To insert text and graphics in a background image by means of a luminance key, use the following procedure.



1 With the BACKGROUND bus buttons, select the background image.

The selected background image appears on the program monitor.

2 With the FOREGROUND bus buttons, select the foreground image.

If a preview monitor is connected, the selected foreground image appears in the preview monitor.

3 Select the effect pattern, and press the TITLE button in the effect transition section, turning it on.

Note

Depending on the effect pattern, it may not be possible to use a luminance key. If such a pattern is selected, the TITLE button does not light. Check the "TITLE" column of the table in the section "Effect Pattern Variant Forms and Decorations" *(page A-22)*, and select a pattern for which this shows a check mark (√).

When the TITLE button lights, the N/R button also automatically lights, indicating that the system is in N/R (normal/reverse) mode. While the TITLE button is lit, it is not possible to switch out of N/R mode.

4 In the TITLE section of the menu control section, press a LUM button, turning it on.

The luminance key menu appears in the menu display. In the following example, the LUM button in column 1 is lit.

T1LUM	Clip	Gain	INVERT	FILL	Density
1/1	0-100	0-100	OFF	VIDEO	0-100
PAGE	F1	F2	F3	F4	F5

5 Either press the CUT button in the effect transition section, or move the fader lever.

A composite of the foreground and background images appears in the program monitor.
At this point, though, (before adjustment), either of the background image or foreground image may not be visible.

When the foreground image consists of dark lettering on a light background
In the luminance key menu, press the F3(INVERT) button, turning it on, then continue to step **6**.

6 Watching the composite image on the program monitor, use the F1(Clip) knob and F2(Gain) knob to adjust the clip and gain as necessary.

To switch between the composite image and the background image
Press the CUT button. This toggles between the composite image and the background image.

To fill the inserted text or image with a color matte (using a color matte as key fill)
You can use the same color as a border or the same color as an effect.
- To use the same color as a border, in the luminance key menu, press the F4(FILL) button to select "BDRMAT".
- To use the same color as an effect, in the luminance key menu, press the F4(FILL) button to select "EFFMAT".

To change the color of color mattes, see the section "Adjusting Color Mattes" (page 3-57).

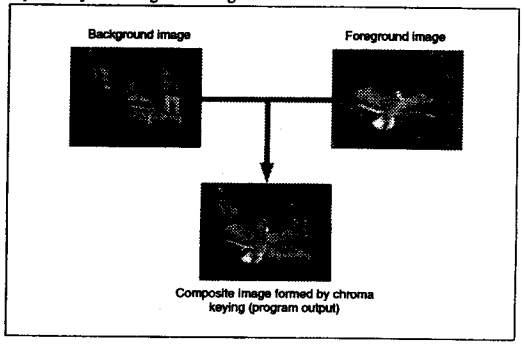
To return from a color matte key fill to the foreground image, press the F4(FILL) button to select "VIDEO".

Creating a composite image with a semi-transparent foreground image
Watching the composite image on the program monitor, turn the F5(Density) knob, to adjust the transparency of the foreground image.

To remove the luminance key
Press the TITLE button in the effect transition section, turning it off.

Chroma Keying

In chroma keying, a key signal is created based on a specific reference color in the foreground image, and used to replace the corresponding parts of the foreground image by the background image. Normally, the foreground image is created with a plain blue background, which is then replaced by the background image.



In this system, you can use either of the following methods to carry out chroma keying.

- **Auto chroma keying**
  You point the cursor at part of the background, thus specifying the keying color. This is the quick and easy way to make a composite image.
- **Manual chroma keying**
  You specify the keying color by manual adjustment. This allows you finer control than with auto chroma keying.

By starting with auto chroma keying, then using manual chroma key adjustments as required, you can get the optimum composite image efficiently.

Two-channel chroma keying

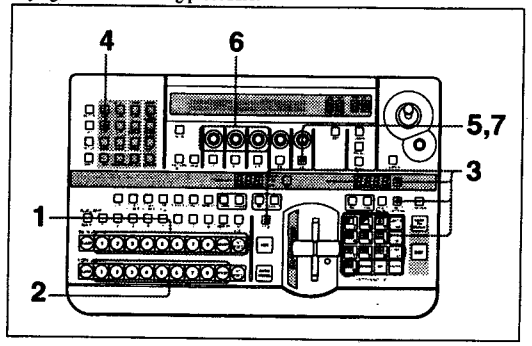
With the optional BKDF-711 2nd Channel DME Board installed, you can use a second chroma key channel.
To use two chroma key channels, set both title 1 and title 2 in the TITLE section of the menu control section. To select the foreground image used for the second chroma key channel, press the FRGD 2 button in the delegation section, turning it on, then with one of the AUXILIARY buttons select the desired video signal.

To use a normal effect for a title key

In this case, use one of the buttons in column 1 of the TITLE section to recall the title 1 setting menu (T1LUM, T1CRK, or T1MSK), and make the settings.

Auto chroma keying

To combine the background image and foreground image by auto chroma keying, use the following procedure.



1 Select the background image with the BACKGROUND bus buttons.

The selected background image appears on the program monitor.

2 Select the foreground image with the FOREGROUND bus buttons.

If a preview monitor is connected, the selected foreground image appears in the preview monitor.

3 Select the effect pattern, and press the TITLE button in the effect transition section, turning it on.

Note

Depending on the effect pattern, it may not be possible to use chroma keying. If such a pattern is selected, the TITLE button does not light. Check the "TITLE" column of the table in the section "Effect Pattern Variant Forms and Decorations" (*page A-22*), and select a pattern for which this shows a check mark (√).

When the TITLE button lights, the N/R button also automatically lights, indicating that the system is in N/R (normal/reverse) mode. While the TITLE button is lit, it is not possible to switch out of N/R mode.

(continued)

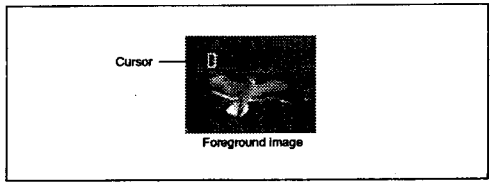
4 In the TITLE section of the menu control section, press the CRK button, turning it on.

In the menu display page 1 of the chroma key menu appears. The following example appears when the CRK button in column 1 is lit.

T1CRK	Clip	Gain	Hue	Angle	AUTO
1/3	0-100	0-100	0-99	0-100	↓
PAGE	F1	F2	F3	F4	F5

5 Press the F5(AUTO) button.

In the program monitor screen, the foreground image appears with a white box cursor.



The menu changes to the auto chroma key menu (T1ACR).

T1ACR	Pos H	Pos V	Size	--AUTO	CRK--
1/1	-100-100	-100-100	0-100	CANCEL	START
PAGE	F1	F2	F3	F4	F5

6 Turn the following knobs to adjust the cursor, to select the background color which is used as the reference color for chroma keying.

Cursor adjustment	Control knob
Move horizontally.	F1(Pos H)
Move vertically.	F2(Pos V)
Change the size.	F3(SIZE)

Notes

- You can also adjust the cursor using the joystick and Z-knob in the LOCATION section.
- If you press a button which is not related to auto chroma key operations, this automatically ends the auto chroma key mode.

If there are variations in the background color
Make the cursor as large as possible.

7 Press the F5(START) button.

This executes the auto chroma key, and a composite of the background and foreground images appears in the program monitor.

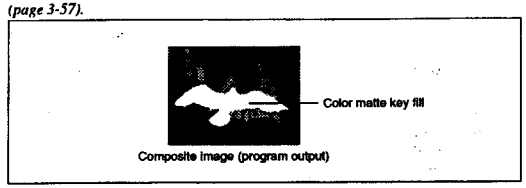
Making fine adjustments to the composite image
Following the manual chroma key procedure *(see next page)*, adjust the hue, clip, and gain for the specified chroma key color.
You can also adjust the luminance of the part cut out by the chroma key.

To switch between the composite image and the background image
Press the CUT button. This toggles between the composite image and the background image.

To fill the inserted text or image with a color matte (using a color matte as key fill)
You can use the same color as a border or the same color as an effect.

- To use the same color as a border, in the chroma key menu (T1CRK), press the F4(FILL) button to select "BDRMAT".
- To use the same color as an effect, in the chroma key menu (T1CRK), press the F4(FILL) button to select "EFFMAT".

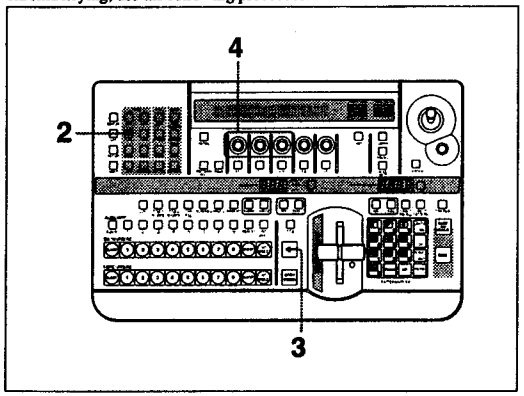
To change the color of color mattes, see the section "Adjusting Color Mattes" (page 3-57).



To return from a color matte key fill to the foreground image, in page 2 of the chroma key menu (T1CRK) press the F4(FILL) button to select "VIDEO".

Manual chroma key

To combine the background image and foreground image by manual chroma keying, use the following procedure.



1 Using the same process as in steps **1** to **3** of the procedure for auto chroma keying (*see page 3-37*), select the background image, foreground image, and effect pattern.

2 In the TITLE section of the menu control section, press the CRK button, turning it on.

In the menu display page 1 of the chroma key menu appears. The following example appears when the CRK button in column 1 is lit.

T1CRK	Clip	Gain	Hue	Angle	AUTO
1/3	0-100	0-100	0-99	0-100	↓
PAGE	F1	F2	F3	F4	F5

3 Press the CUT button in the effect transition section.

A composite of the foreground and background images appears in the program monitor.
At this point, though, (before adjustment), either of the background image or foreground image may not be visible.

4 Watching the composite image on the program monitor. in page 1 of the chroma key menu. adjust the hue, clip, and gain.

When the background part of the foreground image is not completely replaced by the background image
Adjust the hue with the F3(Hue) knob and the clip with the F1(Clip) knob.

When the outline of the foreground image is not clear
Adjust the clip with the F1(Clip) knob and the gain with the F2(Gain) knob.

In combination with a luminance key

1 Press the PAGE button to display page 3 of the chroma key menu. then press the F1(LUM) button, setting the parameter to "ON".

T1CRK	LUM	Clip	Gain	INVERT
3/3	ON	0-100	0-100	OFF
PAGE	F1	F2	F3	F4

2 Watching the composite image on the program monitor. use the F2(Clip) knob to adjust the clip, and the F3(Gain) knob to adjust the gain. To leave dark portions, press the F4(INVERT) button, setting the parameter to "ON".

To switch between the composite image and the background image
Press the CUT button. This toggles between the composite image and the background image.

To fill the inserted text or image with a color matte (using a color matte as key fill)
Use the same procedure as for an auto chroma key *(see page 3-39)*.

Inserting Characters and Graphics (1) — Title Key

Adjusting the hue range for chroma keying (the "angle" setting)

If there are fluctuations in the background color in the foreground image, it may not be immediately possible to key the background image into the whole of the desired background. In this case, you can correct this by increasing the range of hues (the "angle" setting) used for chroma keying. (This means using a wider-angled sector of the hue circle.)

Angle setting (Example: using a blue background color)

- Increasing the angle increases the range of hues replaced by the background image, including shades of cyan and magenta.
- Decreasing the angle decreases the range of hues replaced by the background image, restricting it to closely-matching blues.

Note

If the foreground image includes a color close to the "background" color in a position not intended to be replaced by the background image, then if you make the hue range too wide this part will also be filled by the background image (key fill).

Eliminating bleeding of colors into the edge of the inserted image (color cancel function)

In a chroma key composite image, on the boundary of the inserted image, the "background" keying color in the foreground image (usually blue) tends to bleed into the boundary with the background image. In this case, by replacing the keying color in the composite image by another color (for example gray), the boundary is made to stand out less. This function is called "color cancel".

To use the color cancel function, use the following procedure.

1 In the TITLE section of the menu control section, press the CRK button, turning it on, and display page 2 of the chroma key menu.

The following example appears when the CRK button in column 1 is lit.

T1CRK	COLCAN	Sat	Hue	FILL	Density
2/3	ON	0-100	0-99	VIDEO	0-100
PAGE	F1	F2	F3	F4	F5

2 In the effect transition section, press the TITLE button, turning it on, then press the CUT button.

A composite of the foreground and background images appears in the program monitor.

3 Press the F1(COLCAN) button, setting the parameter to "ON".

4 Watching the composite image on the program monitor, turn the F3(Hue) and F2(Sat) knobs, until the boundary between the background image and foreground image provides a natural match of hue and saturation.

Creating a composite image with a semi-transparent foreground image (density function)

You can make the inserted image semi-transparent, and insert it into the background image.

Use the following procedure.

1 In the TITLE section of the menu control section, press the CRK button, turning it on, to display page 2 of the chroma key menu.

The following example appears when the CRK button in column 1 is lit.

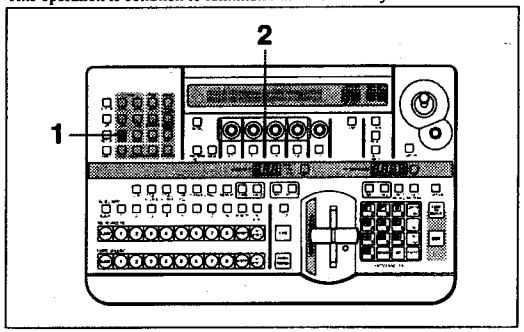
T1CRK	COLCAN	Sat	Hue	FILL	Density
2/3	ON	0-100	0-99	VIDEO	0-100
PAGE	F1	F2	F3	F4	F5

2 Watching the composite image on the program monitor, turn the F5(Density) knob, to adjust the transparency of the inserted image.

Inserting Characters and Graphics (1) — Title Key

Masking Part of a Title Key

You can apply a rectangular mask, to eliminate unwanted parts of the key. The masked part is filled with the background image.
This operation is common to luminance and chroma keys.



1 In the TITLE section of the menu control section, press one of the MASK buttons, turning it on.

The mask menu appears in the menu display.
The following example appears when the MASK button in column 1 is lit.

T1MSK	Left	Right	Top	Bottom	INVERT
1/1	-400-400	-400-400	-300-300	-300-300	OFF
PAGE	F1	F2	F3	F4	F5

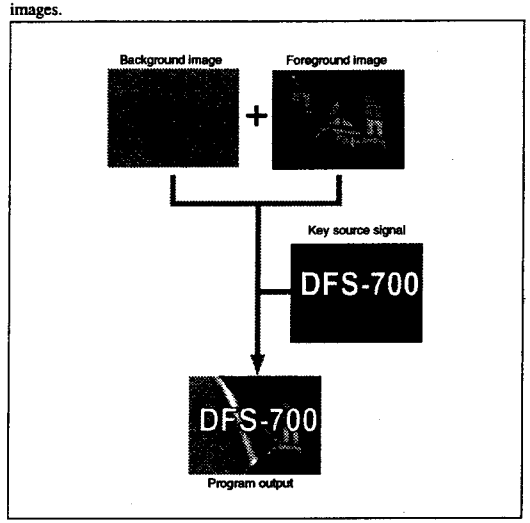
2 Turn the F1(Left), F2(Right), F3(Top), and F4(Bottom) knobs to set the mask region.

Removing the mask
Press the MASK button lit in step **1**, turning it off.

To invert the mask
In the mask menu, press the F5(INVERT) button, setting it to "ON".

Inserting Characters and Graphics (2) — Downstream Key

As its name implies, the downstream key (often abbreviated as DSK) is a key which is added downstream the title keying stages, to the already-formed composite image made up of the background and foreground images.



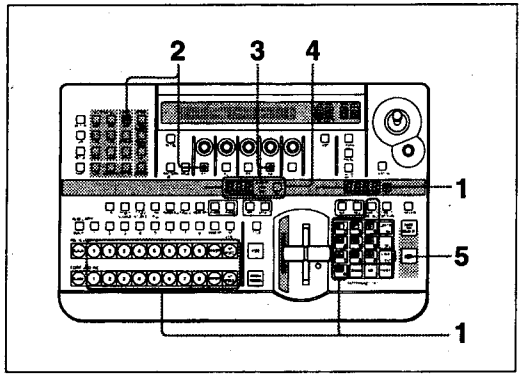
Note that if a preview monitor is connected, you can use it to preview the downstream key on the composite image by pressing the DSK PVW button in the fade-to-black/downstream key section.

Inserting Characters and Graphics (2) — Downstream Key

Procedure

To insert a downstream key, use the following procedure.

For details of key source and key fill signal connections, see the section "Key Signal Connections" (page 6-3).



1 First create the image into which the downstream key is to be inserted.
- **1)** Select the background and foreground images.
- **2)** Select the effect, and create the desired composite image.

2 Select the key source signal for the downstream key.
- **1)** In the DSK section of the menu control section, press the LUM button, turning it on, and display page 2 of the downstream key (DSK) menu.

DSK	SOURCE
2/2	EXT
PAGE	F1

- **2)** Press the F1(Source) button, and select the signal to be used as the key signal.
  - **EXT:** Use the signal input to the DSK KEY IN connector (external key mode).
  - **SELF:** Use the signal specified as "DSK FILL" in the delegation section (self-keying mode).

3 Select the downstream key fill signal.
- **1)** Press the PAGE button, and switch to page 1 of the downstream key menu.

DSK	Clip	Gain	INVERT	FILL	Density
1/2	0-100	0-100	OFF	VIDEO	0-100
PAGE	F1	F2	F3	F4	F5

- **2)** Press the F4(FILL) button, to select the signal used as the key fill signal.
  - **VIDEO:** Use the signal specified as "DSK FILL" in the delegation section. When you select this, press the DSK FILL button in the delegation section, turning it on, then select the desired bus with the AUXILIARY buttons.
  - **DSKMAT:** Use an internal DSK matte signal.
  - **NONE:** Do not use a key fill signal (applying the border only).

Note

When you select "NONE", DSK border automatically goes on. If you now forcibly turn the DSK border off, the downstream key will not appear.

4 Set the downstream key transition time (the time taken to insert the key).
For an instantaneous insert, set the transition time to zero.

For details of the setting, see the section "Setting the Transition Time" (page 3-51).

5 Press the DSK button to insert the downstream key.

When the downstream key has been inserted, the DSK button lights red.
During the transition, the DSK button lights amber.

Note

Downstream keys are always delayed by 6H.

Deleting the downstream key

When the DSK button is lit red, press it, turning it off.

Adjusting the outline of the downstream key

If the outline of the inserted text or graphics is not sharp, in page 1 of the downstream key menu, adjust the F1(Clip) and F2(Gain) knobs as follows.
- **To adjust the degree to which the key is cut out,** turn the F1(Clip) knob to adjust the clip level.
- **To adjust the sharpness of outline of the key,** turn the F2(Gain) knob to adjust the key gain.

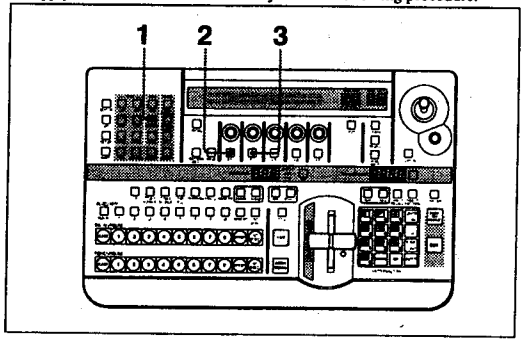
To invert the downstream key source signal
Depending on the desired sense of the key source signal (whether the white or black portions form the key), in page 1 of the downstream key menu make the following setting.
- **For white lettering on a black background,** press the F3(INVERT) button, setting it to "OFF".
- **For black lettering on a white background,** press the F3(INVERT) button, setting it to "ON".

Applying a border to a downstream key

You can apply a border to the text or graphics inserted as a downstream key, and adjust the border color.

For details of adjusting the border color, see the section "Adjusting Color Mattes" (page 3-57).

To apply a border to a downstream key, use the following procedure.



1 In the DSK section of the menu control section, press the BORDER button, turning it on.

The downstream key border setting menu (DSK)appears.

DSK	TYPE
1/1	Double

PAGE F1

2 Press the F1(TYPE) button, to select the border type.

Wide: wide border
Narrow: narrow border
Drop: drop border
Double: double border (combination of drop and narrow borders)

If you selected drop border or double border, you can now specify the border position with the F2 button.

DSK	TYPE	POS
1/1	Double	T+R

PAGE F1 F2

3 If in step **2** you selected drop border or double border, press the F2(POS) button to specify the border position.

Each time you press the button it cycles to the next in the sequence "T+L" (top and left)" → "T+R" (top and right)" → "B+R" (bottom and right) → "B+L" (bottom and left).

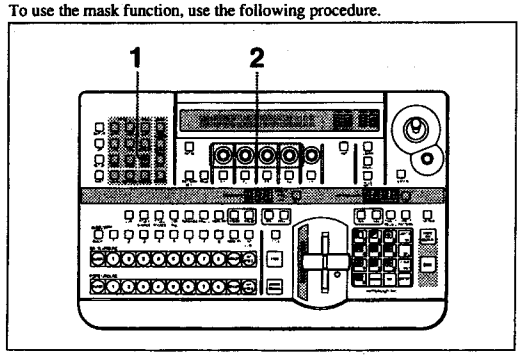
To remove the border
In the DSK section of the menu control section, press the BORDER button, turning it off.

Inserting Characters and Graphics (2) — Downstream Key

To mask a part of the downstream key

You can mask out unwanted portions of a downstream key (text or graphics).

To use the mask function, use the following procedure.



1 In the DSK section of the menu control section, press the MASK button, turning it on.

The mask menu (DKMSK) appears in the menu display.

DKMSK	Left	Right	Top	Bottom	INVERT
1/1	–400-400	–400-400	–300-300	–300-300	OFF
PAGE	F1	F2	F3	F4	F5

2 Turn the F1(Left), F2(Right), F3(Top), and F4(Bottom) knobs to set the mask region.

Removing the mask
Press the MASK button lit in step **1**, turning it off.

To invert the mask
In the mask menu, press the F5(INVERT) button, setting the parameter to "ON".

Setting Up a Transition

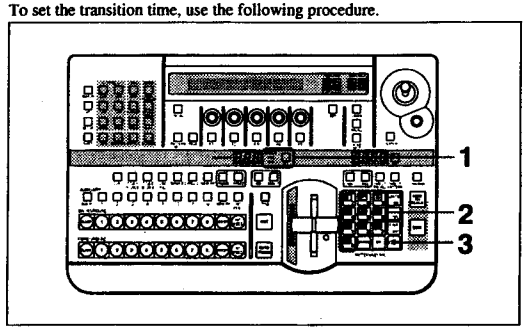
This section describes how to set the transition time and transition direction.

Setting the Transition Time

The transition time measures the duration of an effect in frames (1/30 second (NTSC) or 1/25 second (PAL)), ranging from 0 to 999 frames. In this system, you can set the transition time for a downstream key or fade-to-black independently of the transition time for an effect.

Procedure

To set the transition time, use the following procedure.



1 Press the SET button in the effect transition section until the appropriate display window mode indicator (EFFECT, DSK, or FTB) is lit.

EFFECT: for setting the effect transition time
DSK: for setting the downstream key transition time
FTB: for setting the fade-to-black transition time

Note

If the EDIT button in the user program section is lit, it is not possible to set the transition time. Press the EDIT button, turning it off.

2 With buttons 0 to 9 in the pattern/numeric keypad, enter the desired transition time (0 to 999 frames).

The value entered appears in the TRANS RATE display window, and dots appear to the lower right of the digits. You can use the UP and DOWN buttons to adjust the value.

(continued)

3 Press the ENTER button.

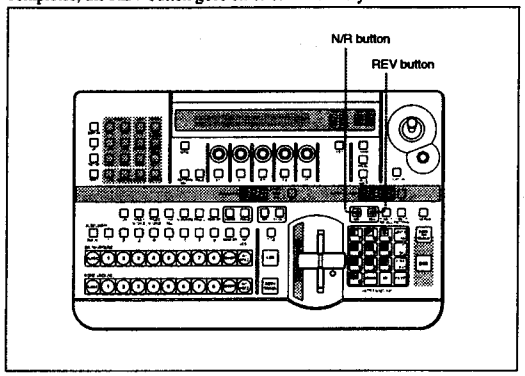
The dots to the lower right of the digits disappear. confirming the transition time.

If you make a mistake entering the time
Before pressing the ENTER button press the P IN P/RST button to return the display to the last confirmed value, then enter the correct time.

Setting the Transition Direction

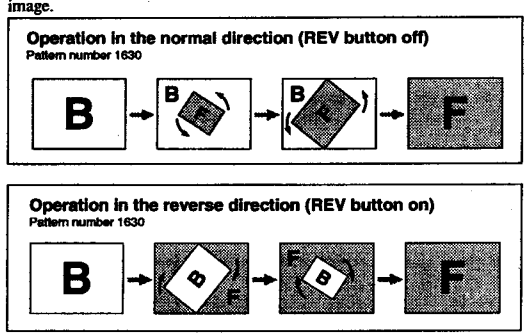
Transition effects are normally executed in the direction in which the foreground image enters (forwards, or "normal"). To reverse the direction, before executing the transition, press the REV button in the effect transition section, turning it on.
Pressing the REV button once more turns it off, and reverts to the normal direction.

If you have selected an animation effect, the N/R button lights, and the normal and reverse directions are used alternately. Each time an effect completes, the REV button goes on or off alternately.



Operation of transition effects

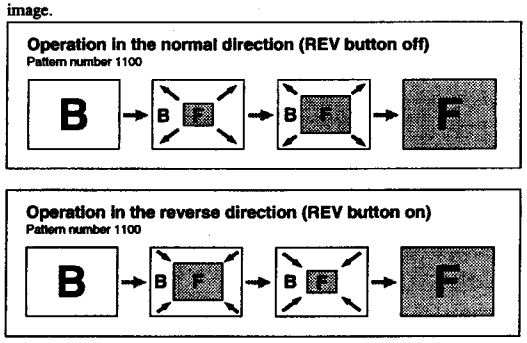
The following figure illustrates the execution of an example transition effect. In the figure, "B" is the background image and "F" the foreground image.



For the direction of operation of other transition effects, see the section "Effect Motion Types" (page A-21).

Operation of animation effects

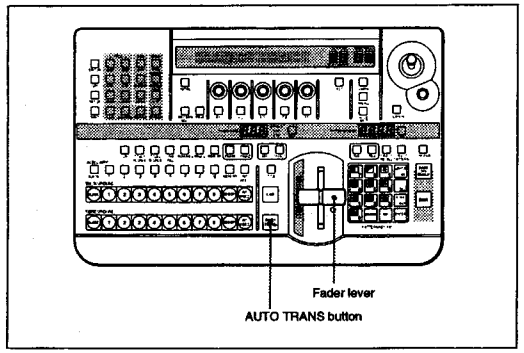
The following figure illustrates the execution of an example animation effect. In the figure, "B" is the background image and "F" the foreground image.



For the direction of operation of other animation effects, see the section "Effect Motion Types" (page A-21).

Executing an Effect

To execute an effect, after setting the execution direction (normal/reverse), in the effect transition section press the AUTO TRANS button, or move the fader lever.



Using the fader lever

By moving the fader lever from one end of its travel to the other at any desired speed, you can manually control the transition.
The transition indicator on the left of the fader lever lights progressively corresponding to the status of the transition. When the transition completes, the transition indicator goes completely off.
For an effect in which the image switches like a cut, the transition occurs when the fader lever is in the center position.

Note

After powering on the system, move the fader lever once through the whole of its travel. This will ensure that the fader lever operates correctly.

To pause the transition
Stop moving the fader lever.

To resume the transition
Start moving the fader lever again.

Using the AUTO TRANS button

To execute the effect automatically at the preset transition time, press the AUTO TRANS button, turning it on.

To pause the transition
During the transition, press the AUTO TRANS button, turning it off.

Note

If the fader lever is in an intermediate position, then the transition pauses at the corresponding position. To make sure the transition does not pause, first move the fader lever to either end of its travel.

To resume the transition
Press the AUTO TRANS button again.

Using the fader lever and AUTO TRANS button together

You can use the AUTO TRANS button to complete a transition started and paused with the fader lever, or in the opposite way, use the fader lever to complete a transition started and paused with the AUTO TRANS button.

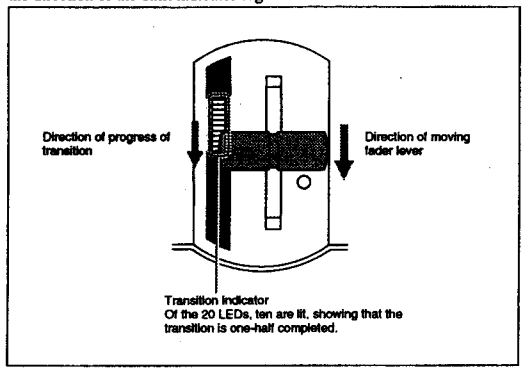
- If you resume a transition partially executed with the fader lever, using the AUTO TRANS button, then the transition time taken is in proportion to the setting for the entire transition. For example, if the transition time is set to 100 frames, and you carry out the equivalent of 25 frames with the fader lever, then press the AUTO TRANS button, the remainder of the transition will take 75 frames.
- If you partially execute the transition with the AUTO TRANS button, then start moving the fader lever, the transition resumes when the fader lever reaches the corresponding intermediate position.

Note

When you carry out an auto transition by controlling the processor unit from an external editor through the EDITOR connector, then regardless of the fader lever position, the transition is executed in its entirety.

Checking the direction and state of progress of the transition

Whether you are carrying out the effect manually or automatically, the transition indicator on the left of the fader lever (20 LEDs) shows the state of progress of the transition.
When you start the transition, the indicator lights progressively in the direction of the transition, and goes off when the transition completes.
If you pause the transition, the indicator remains on in the corresponding position.
You can always complete a paused transition by moving the fader lever in the direction of the unlit indicator segments.

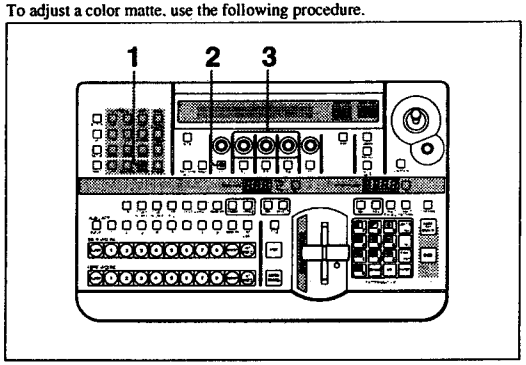

Direction of progress of transition
Direction of moving fader lever
Transition indicator
Of the 20 LEDs, ten are lit, showing that the transition is one-half completed.

Adjusting Color Mattes

You can adjust the color of each color matte individually, and also copy parameters from other color mattes.

Procedure

To adjust a color matte, use the following procedure.



1 Press the MATTES button in the menu control section, to display page 1 of the MATTE menu.

MATTE	SELECT	Lum	Sat	Hue	CH2BRD
1/2	INT V	0-100	0-100	0-99	BRDMAT
PAGE	F1	F2	F3	F4	F5

2 Press the F1(SELECT) button, to select the color matte to adjust.

INT V (internal video): color matte used for foreground and background images
BORD (border): color matte used to fill the border applied to an effect pattern, and as key fill for a title key
EFFECT: general-purpose color matte for use in effects
SHADOW: color matte used for shadows around an input image (fill)
DSKFL (DSK fill): color matte used as key fill for a downstream key
DSKBD (DSK border): color matte used for a downstream key border
FTB: color matte used in place of black in the fade-to-black function

3 Turn the F2(Lum), F3(Sat), and F4(Hue) knobs, to adjust the luminance, saturation, and hue.

Note

If you vary the luminance of a color matte signal with high saturation, the saturation is automatically adjusted so as not to go outside the signal specifications.

Adjusting Color Mattes

To copy a matte color

To copy the color matte parameters from another color matte, use the following procedure.

1 Press the MATTES button in the menu control section, to display page 2 of the MATTE menu. (Press the PAGE button to change pages.)

MATTE	FROM	TO	COPY	INTVID	PTN
2/2	INT V	BORD	EXEC	Matte	1
PAGE	F1	F2	F3	F4	F5

2 Press the F1(FROM) button, to select the color matte to be copied.

3 Press the F2(TO) button, to select the color matte to which you want to make the copy.

4 Press the F3(COPY) button, to carry out the copy.

Adjusting Image Colors — Color Correction

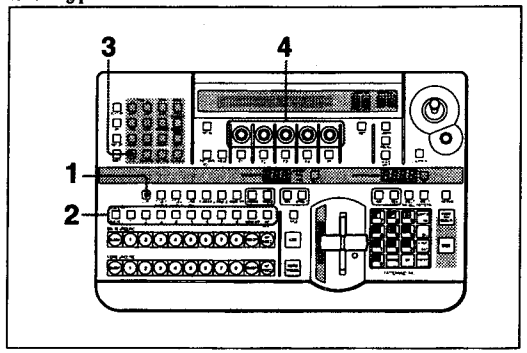
The color correction function allows you to adjust the overall color balance of images, or correct the white balance for different lighting color temperatures.
You can apply color correction to the signal input to any one of the primary input connectors (VIDEO INPUT 1 to 8).

Notes

- Color correction settings cannot be saved in a snapshot.
- The color correction function cannot be used for the effect patterns numbered 2261, 2264, 2267, 2269, and 2279.

Procedure

To adjust the color balance with the color correction function, use the following procedure.



1 Press the CCR button in the delegation section, turning it on.

2 Press one of the AUXILIARY buttons, turning it on, to select the bus to which the color adjustment applies.

3 Press the CCR button in the menu control section, turning it on, to display the color correction menu (CCR).

CCR	Gain	Hue	Offset	HueRot	Gamma
1/1	0-100	0-99	0-100	0-99	0-100
PAGE	F1	F2	F3	F4	F5

(continued)

Adjusting Image Colors — Color Correction

4 Watching the image on the monitor, turn the F1 to F5 knobs to adjust the color.

F1(Gain): adjust the chrominance gain (the depth of the colors).
F2(Hue): adjust the hue.

Note

When F3(Offset) is set to its minimum value of zero, turning the F2(Hue) knob has no effect on the hue.

F3(Offset): vary the adjustment range of the F2(Hue) knob. The larger the value of "Offset," the wider the range of color adjustment. A smaller value for "Offset" means that the F2(Hue) knob can be used for fine adjustment.
F4(HueRot): set the hue.
F5(Gamma): adjust the gamma value of the luminance signal.

To turn off the color correction function

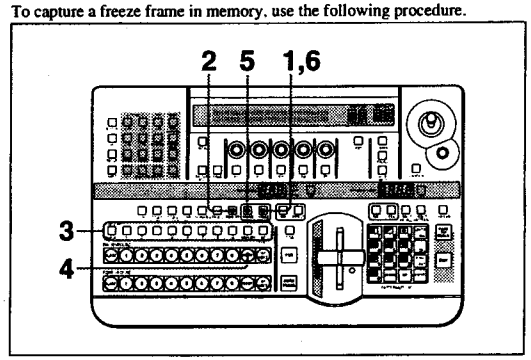
In the menu control section press the CCR button, turning it off.

Freezing an Input Image — Frame Memory Function

Using the frame memory function, you can capture a "freeze frame" from input video or store a still frame. You can then use this still image as a video source.

Procedure

To capture a freeze frame in memory, use the following procedure.



1 If the FREEZ button is lit, press it, turning it off.

2 In the delegation section press the MEMORY button, turning it on.

3 Press one of the AUXILIARY buttons, turning it on, to select the input video signal.

4 Press the MEMORY button in the BACKGROUND bus button row, turning it on.

5 • To capture a frame from still video, press the FRAME button turning it on.
• To capture a field from moving video, leave the FRAME button off. (Pressing the FRAME button toggles it on and off.)

6 Press the FREEZ button, turning it on, to capture the image. (For capture from a moving video input, press the FREEZ button at the point you want to capture.)

The captured image appears on the output bus, and is written to memory.

Note

Even if other than MEMORY is selected on the BACKGROUND bus buttons, you can still capture the selected image with an AUXILIARY button.

Freezing an Input Image — Frame Memory Function

Recalling a freeze frame saved in memory
In the BACKGROUND or FOREGROUND bus button row, press MEMORY, turning it on.

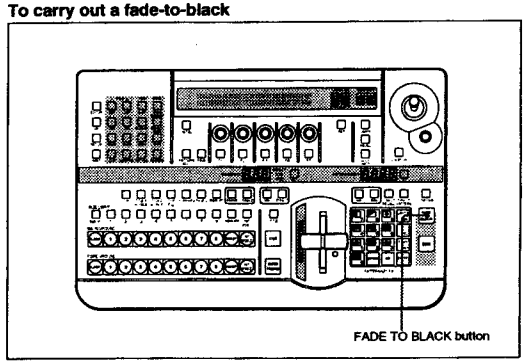
Note

When the unit is powered off, the saved frame is lost from memory.

Fade-to-Black

The fade-to-black allows you to gradually fade the image on the preview monitor (the background image) until it is completely black.

To carry out a fade-to-black



Press the FADE TO BLACK button in the fade-to-black/downstream key section.
During the transition, the FADE TO BLACK button lights amber, and when the transition completes (when the image is completely black), lights red.

To end a fade-to-black
When the FADE TO BLACK button is lit red (the screen is black), press the FADE TO BLACK button. The output gradually changes from black to the image selected on the BACKGROUND bus buttons.

To reverse the direction of a fade-to-black transition during execution
During the transition (while the FADE TO BLACK button is lit amber), press the FADE TO BLACK button.
This immediately reverses the direction of the transition.

Setting the fade-to-black transition time
Follow the procedure in the section "Setting the Transition Time" (*page 3-51*).

To change the color from black
Follow the procedure in the section "Adjusting Color Mattes" (*page 3-57*).

To prohibit a fade-to-black
See F4 in the section "Control Panel Setup (page 5/8)" (*page 6-10*).

Chapter 4

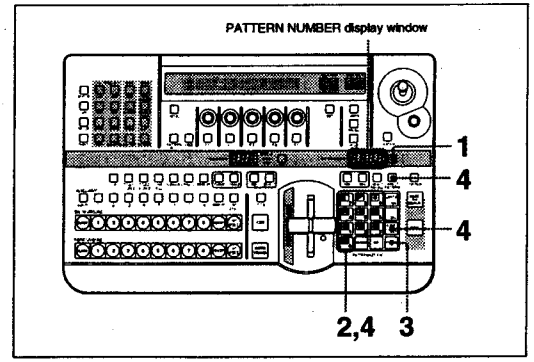
Advanced Operations

Changing Direct Pattern Assignments

You can change the effect patterns assigned to the buttons 0 to 9 and P IN P/RST. Doing so allows you to select frequently used patterns simply by pressing the corresponding buttons in direct pattern selection mode.

To change the direct pattern assignment

To change the direct pattern assignment to the buttons 0 to 9 and P IN P/RST, use the following procedure.



1 Press the SET button.

The button lights, and the unit enters pattern number entry mode.

(continued)

Changing Direct Pattern Assignments

2 Use buttons 0 to 9 to enter the pattern number you want to assign to a button.

For more information about pattern numbers, see the section "Effect Pattern Image List" (page A-29).

The number you enter appears in the PATTERN NUMBER display window.

3 Press the ENTER button.

4 While holding down the DIRECT PATTERN button, press the button (0 to 9, or P IN P/RST) to which you want to assign the pattern.

The button you pressed lights, and the pattern number entered in step **2** is assigned to the button.

To restore the default assignments (direct pattern reinitialization)

After changing pattern assignments, you can restore the factory default assignments shown in "Example Effects" *(page 3-18)*.

To return all of the buttons 0 to 9 and P IN P/RST to their factory default assignments, use the following procedure.

1 Press the SET UP button.

The setup menu appears.

2 Press the PAGE button to display page 6/8.

3 Press the F4(KEYPAD) button to set it to "ON".

4 Press the F5(EXEC) button.

5 Press the F3(OK) button.

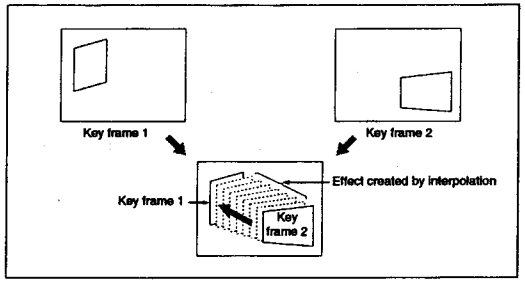
This returns all of the assignments to the 0 to 9 and P IN P/RST buttons to their factory default settings.

User Program Effects

In addition to the internal effect patterns, you can also create user-customized effect patterns. These are referred to as "user program effects." With standard equipment you can save a maximum of 40 effects. You use these effect patterns in the same way as the internal patterns, using the assigned number.

Constructing a User Program Effect

You build a user program effect from key frames, which show an outline of the animation.
A user effect can consist of up to eight key frames, numbered from 1 to 8. When you execute the effect, it runs through the key frames in sequence, starting from the highest numbered, and ending on key frame 1.
Therefore, when creating the effect you save the movement in the reverse direction (with the image selected on the foreground bus moving outside the screen).
By pressing the REVERSE button, turning it on, you can execute the effect in the reverse order of the created key frames. You can adjust the interval between key frames by a menu setting.
When you execute a user program effect, the interval between key frames is automatically interpolated using spline curves, producing a smooth effect. You can also adjust the smoothness of the spline curves (i.e. the movement) when executing the effect.



If you execute a user program effect that consists of a single key frame, the result is that the foreground image appears against the background image, subjected only to the effect defined for key frame 1.

Types of User Program Effect

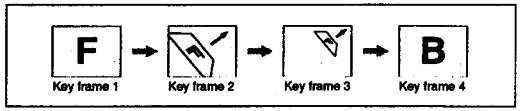
There are four types of user program effects. The four types must be registered saved in the pattern number ranges shown below.

Effect type		Pattern number
Linear	Transition	9000 to 9009
	Animation	9100 to 9109
Nonlinear	Transition	9200 to 9209
	Animation	9300 to 9309

Linear: effects built from rotation, magnification, and movement of the x-, y-, and z-axes
For details of the modification parameters, see page 4-6.

Nonlinear: modifications of the page turn, page roll, and sphere effects, together with z-axis rotation, magnification, and movement
For details of the modification parameters, see page 4-7.

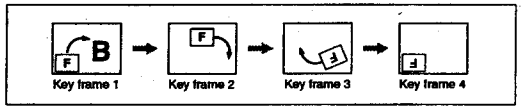
Transition effects: effects which accomplish a transition from one scene to another. After the effect completes, the background image (B) and foreground image (F) are interchanged.



Example of a transition user program effect

When you execute an effect saved as shown above in the "normal" direction (with the REV button off), the key frames go in the sequence from 4 to 1.

Animation effects: effects in which the foreground image (F) remains on the background image (B). You can vary the shape of the foreground image, or move it about the screen.



Example of an animation user program effect

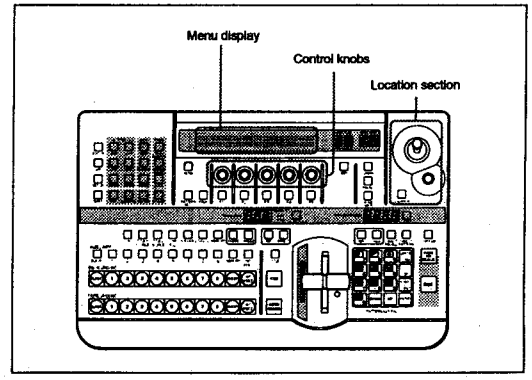
When you execute an animation effect saved as shown above in the "normal" direction (with the REV button off), again the key frames go in the sequence from 4 to 1.

Modification Parameters

You can adjust key frames, using the effect control section and location section to set the parameters described on pages 4-6 and 4-7.

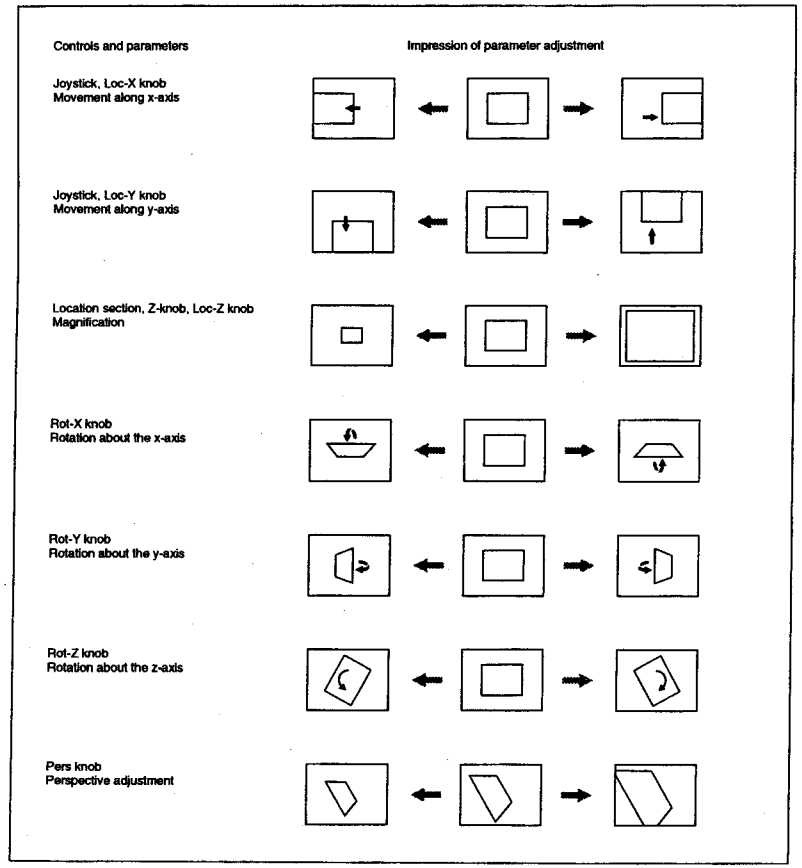
- If you specify a linear user program effect number, the following three pages appear in the menu display.
  Page 1/3: Rot-X, Rot-Y, Rot-Z, Pers
  Page 2/3: Loc-X, Loc-Y, Loc-Z, KfDur
  You can control Loc-X, Loc-Y, and Loc-Z from the location section.
  Page 3/3: key frame temporary storage

- If you specify a nonlinear user program effect number, the following three pages appear in the menu display.
  Page 1/3: Angle, Offset, Rot-Z, Radius, FORM
  Page 2/3: Loc-X, Loc-Y, Loc-Z, KfDur
  You can control Loc-X, Loc-Y, and Loc-Z from the location section.
  Page 3/3: key frame temporary storage

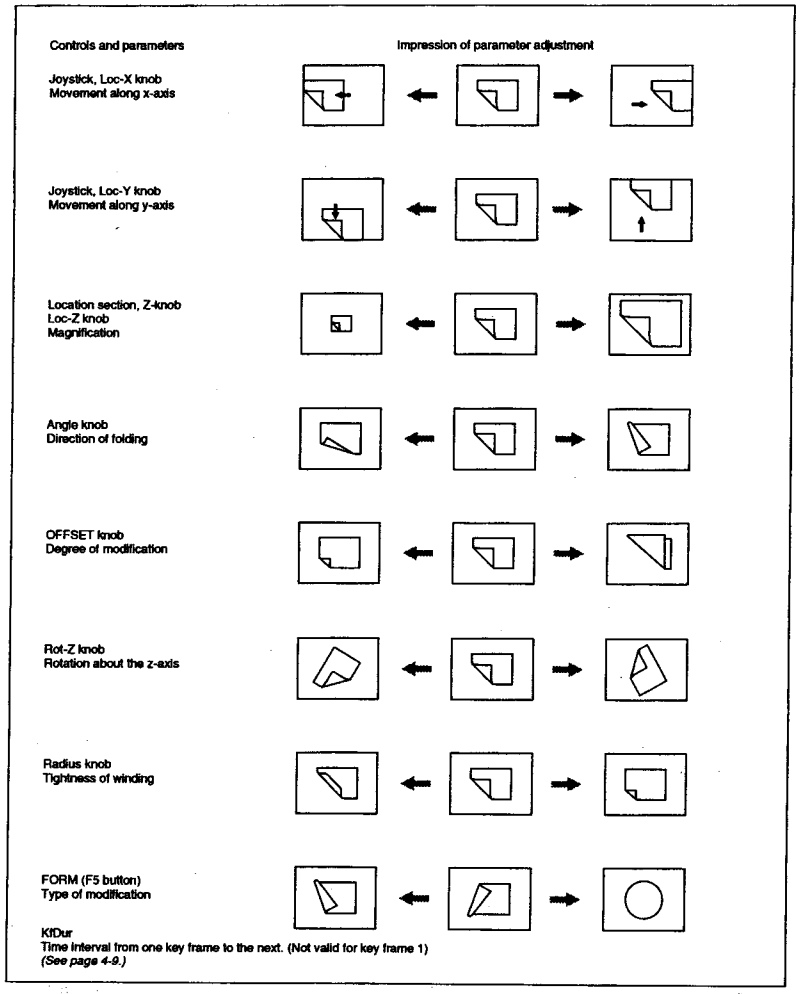


User Program Effects

Parameters for linear user program effects (9000 to 9009 and 9100 to 9109)



Parameters for nonlinear user program effects (9200 to 9209 and 9300 to 9309)



Displaying parameter values

The numerical values of the parameters appear in the menu.

Numerical parameter values

Parameter	Function	Value range	Default
Loc-X	Movement along x-axis	–800 to +800 a)	0
Loc-Y	Movement along y-axis	–600 to +600 b)	0
Loc-Z	Magnification	0 to 200	100
KfDur	Key frame duration	1 to 100	50
Rot-X	Rotation about the x-axis	–400 to +400 c)	0
Rot-Y	Rotation about the y-axis	–400 to +400 c)	0
Rot-Z	Rotation about the z-axis	–400 to +400 c)	0
Pers	Perspective	0 to 400	200
Angle	Direction of folding	–100 to +100 c)	20
Offset	Degree of modification	0 to 200	0
Rot-Z	Rotation about the z-axis	–400 to +400 c)	0
Radius	Radius	0 to 100	0
FORM	Type of modification	TURN, ROLL, SPHERE d)	TURN

a) 600 corresponds to the full width of the screen.
b) 300 corresponds to the full height of the screen.
c) 100 corresponds to 360 degrees.
d) For SPHERE, the Angle and the Radius parameter do not function.

Resetting the parameters to their initial values

- To reset all of the parameters, hold down the INITIAL button, and press the PATTERN ADJ button.
  The initial values of the parameters are for an unmodified image occupying the whole screen.
- To reset all of the parameters on a particular page, hold down the INITIAL button, and press the PAGE button.
- To reset a particular parameter only, press the corresponding function button while holding down the INITIAL button.

About the key frame duration

The KfDur value (key frame duration) for key frame n corresponds to the interval between key frame n and key frame n+1. Therefore, if the settings are as follows:

Key frame 1 ... not effective
Key frame 2 ... KfDur 100
Key frame 3 ... KfDur 50
Key frame 4 ... KfDur 50

The interval between key frames 1 and 2 is twice that between the other pairs of frames. For example, if the transition duration is set to 100 frames, the transition will proceed as follows:

Key frame 4 → 3 ... 25 frames
Key frame 3 → 2 ... 25 frames
Key frame 2 → 1 ... 50 frames

Setting the type of interpolation

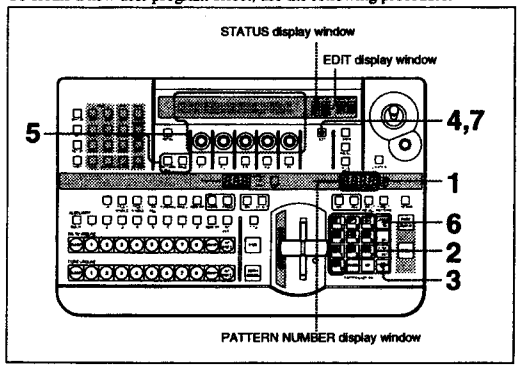
When executing the effect, using the F1 button in the menu, you can set the type of interpolation between key frames as follows:

Lin: linear interpolation
S-Lin: S-curve interpolation
Spln: spline interpolation
V-Spln: parameterized spline interpolation

If you select V-Spln, with the F2(Tens) knob you can adjust the tension of the spline curve in the range –100 to +100. This controls the smoothness, with the initial value 0 and –100 giving the smoothest result.

Creating New User Program Effects

To create a new user program effect, use the following procedure.



1 Press the SET button.

2 Using the numeric buttons, enter the pattern number of the user program effect to be created.

If you enter a number outside the user program effect range, an audible warning sounds in step **4**. (The warning sounds only if the item BEEPER on page 5 of the setup menu is set to ON.)

Effect type		Pattern number
Linear	Transition	9000 to 9009
	Animation	9100 to 9109
Nonlinear	Transition	9200 to 9209
	Animation	9300 to 9309

The number you entered appears in the PATTERN NUMBER display window.

3 Press the ENTER button.

The STATUS display window should show "1". If it shows any value other than "1" this means that there are already a number of key frames assigned to this number.

4 Press the EDIT button.

The button lights, the system enters user program edit mode, and the monitor shows the image (key frame 1) selected on the FOREGROUND bus buttons. This is because for a new effect, key frame 1 is saved as an unmodified, full-screen foreground.

5 In the menu, set the parameters, and create key frame 2.

When creating a transition effect, see the section "Notes on creating a transition user program effect" below.

6 When you have the image you want to save, press the LAST X/INS button.

This creates key frame 2 with the parameters set in step **5**, and saves the key frame after key frame 1. A "2" appears in the EDIT display window and STATUS display window.
If this is an animation effect, instead of the LAST X/INS button, you can press the ENTER button to save the key frame created with the parameters set in step **5** as key frame 1 (thus modifying key frame 1). This is because an animation effect is allowed to have key frame 1 different from an unmodified foreground image.

By repeating steps **5** and **6** (making parameter settings and adding key frame with the LAST X/INS button), you can create the required sequence of key frame (maximum eight).
The STATUS display window shows the number of saved key frames.

7 When you have saved all the required key frames, press the EDIT button once more.

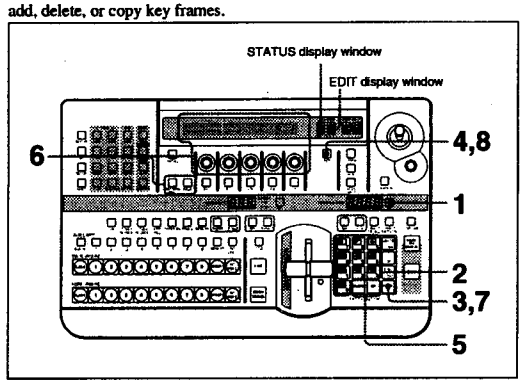
The button goes off, and the created user program effect is now ready to be used.

Notes on creating a transition user program effect

- Make key frame 1 an unmodified full-screen image. (In a new pattern, key frame 1 is automatically saved as a full-screen image.)
- In the last key frame, make the background image completely disappear. (Either make it of zero size, or move it outside the screen area.) This will make the created effect smoother.
- For the linear PERS parameter and the nonlinear FORM parameter, the key frames must all have the same value. The value saved in the last key frame is used for all key frames.

Editing User Program Effects

You can recall a created user program effect, and change its parameters, or add, delete, or copy key frames.



To recall a user program effect

Use the following procedure.

1 Press the SET button.

2 Use buttons 0 to 9 to enter the user program effect number.

The number you entered appears in the PATTERN NUMBER display window.

3 Press the ENTER button.

The STATUS display window shows the number of key frames in the user program effect you specified in step **2**.

4 Press the EDIT button.

The button lights, and the editing screen for the user program effect you specified in step **2** (the image selected on the FOREGROUND bus buttons) appears.
The STATUS display window shows the number of key frames saved in the user program effect.

To change the key frame parameters

After carrying out the procedure to step **4** in the section "To recall a user program effect" above, use the following procedure.

5 Press the UP or DOWN button in the pattern/numeric keypad, so that the number of the key frame for which you want to change the parameters appears in the EDIT display window.

6 Change the parameters in the menu.

7 Press the ENTER button.

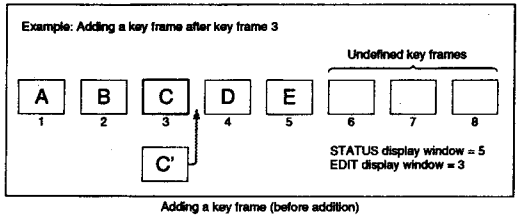
This saves the changed key frame parameters.

Repeat steps **5**, **6**, and **7**, to change the key frame parameters in all desired key frames in turn.

8 When all the changes are made, EDIT button.

The button goes off, and the modified user program effect is resaved.

Adding a key frame



Adding a key frame (before addition)

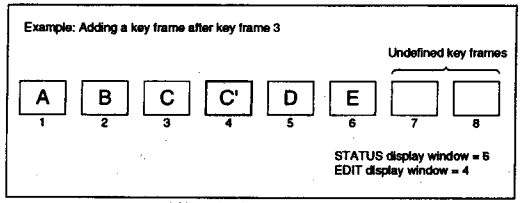
After carrying out the procedure to step **4** in the section "To recall a user program effect" on the page 4-12, use the following procedure.

5 Press the UP or DOWN button in the pattern/numeric keypad, so that the number of the key frame before where you want to insert the new frame (key frame 3 in the example above) appears in the EDIT display window.

6 Set the parameters in the menu.

7 Press the LAST X/INS button.

This inserts a new key frame with the parameters you set in step **6** after the key frame specified in step **5**, and the number of key frames shown in the STATUS display window increases by 1.



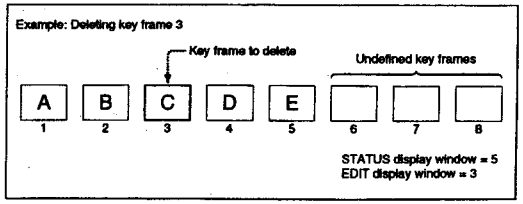
Adding a key frame (after addition)

Repeat steps **5** to **7** as required to add more key frames.

8 When you have added all the key frames, press the EDIT button.

The button goes off, and the user program effect is resaved with the added key frames.

Deleting a key frame



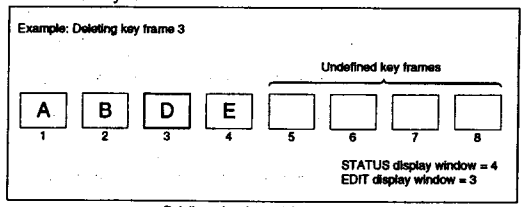
Deleting a key frame (before deletion)

After carrying out the procedure to step **4** in the section "To recall a user program effect" on the page 4-12, use the following procedure.

5 Press the UP or DOWN button in the pattern/numeric keypad, so that the number of the key frame you want to delete (key frame 3 in the example above) appears in the EDIT display window.

6 Press the DEL button. (To prevent you from inadvertently deleting a key frame, you must hold the button down for at least 0.5 seconds.)

An alarm sounds, and the key frame you specified in step **5** is deleted. The number of key frames shown in the STATUS display window decreases by 1.



Deleting a key frame (after deletion)

Repeat steps **5** and **6** as required to delete more key frames.

(continued)

7 When you have deleted all the desired key frames, press the EDIT button.

The button goes off, and the user program effect is resaved without the deleted key frames.

Temporarily saving key frame data (temporary assignment function)

While editing user program effects, you can temporarily assign key frame data to keypad numeric buttons. This makes it easy to recall the data for use in changing or adding key frames. You can save 10 sets of data each for linear and nonlinear effects, for a total of 20 key frames.

To save key frame data

Use the following procedure.

1 Press the EDIT button to switch to user program edit mode.

2 Adjust the parameters in the menu, to create the key frame.

3 Display page 3/3 of the menu.

4 Hold down the F1(CpTo+) button, and press a numeric button in the pattern/numeric keypad.

The indication for the selected number in the menu changes from "–" to "*", and this saves the key frame temporarily.

To recall a key frame

Use the following procedure.

1 Press the EDIT button to switch to user program edit mode.

2 Display page 3/3 of the menu.

3 Hold down the F2(CpFrm+) button, and press a numeric button in the pattern/numeric keypad.

This recalls the temporarily saved key frame.

Notes

- You cannot use a linear key frame in a nonlinear effect, nor a nonlinear key frame in a linear effect.
- The key frames temporarily saved in numeric buttons are lost when the DFS-700/700P is powered off.

Copying a key frame

You can use the temporary assignment function to copy data from one key frame to another.
Use the following procedure.

1 Recall the user program effect you want to copy from, and press the EDIT button, turning it on.

For details see "To recall a user program effect" (page 4-12).

2 Press the UP or DOWN button in the pattern/numeric keypad until the number of the key frame you want to copy from appears in the EDIT display window.

3 Display page 3/3 of the menu.

4 Hold down the F1(CpTo+) button, and press a numeric button in the pattern/numeric keypad.

The indication for the selected number in the menu changes from "–" to "*", and this saves the key frame temporarily.

5 Press the EDIT button, turning it off, and exit user program edit mode.

6 Recall the user program effect to which you want to copy, and press the EDIT button, turning it on.

Note

The copy destination must be a user program effect of the same type (linear or nonlinear) as the copy source.

7 Press the UP or DOWN button in the pattern/numeric keypad, until the number of the key frame you want to copy to appears in the EDIT display window.

8 In page 3/3 of the menu, hold down the F2(CpFrm+) button, and press the numeric button in which you saved the key frame in step **4**.

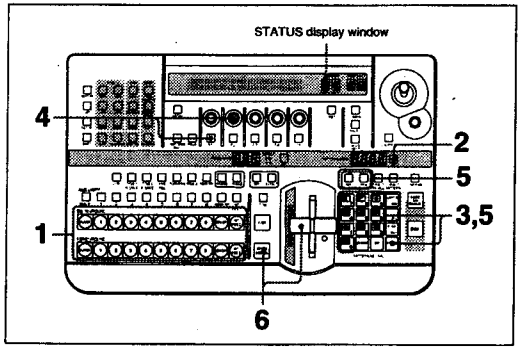
9 Press the ENTER button.

This copies the key frame data to the destination.

10 When the copy is completed, press the EDIT button, turning it off.

Executing User Program Effects

You execute a user program effect in the same way as a built-in effect, by entering the pattern number.
Transitions between the key frames in user program effect are smooth because spline interpolation is used to generate intermediate effects. You can control the smoothness of transitions by adjusting the spline curve.
To execute a user program effect, use the following procedure. Except for step **4**. the procedure is the same as for executing a built-in effect by specifying the pattern number.



1 Select the background and foreground images.

2 Press the SET button.

3 In the pattern/numeric keypad, enter the user program effect number with buttons 0 to 9 and press ENTER.

The STATUS display window shows the number of key frames in the effect.

4 If necessary, use F1 button and F2 knob to adjust the smoothness of the transition.

5 Set the duration and direction of the transition as required.

6 Execute the effect with the fader lever or AUTO TRANS button.

Deleting All User Program Effects

To delete all user program effects, use the following procedure.

1 Press the SET UP button.

The setup menu appears.

2 Press the PAGE button, to display page 6/8.

3 Press the F4(USRPGM) button, to set it to "ON".

4 Press the F5(EXEC) button.

A confirmation message appears.

5 To go ahead and delete all user program effects, press F3(OK); to cancel press F5(CANCEL).

When you press F3, all of the saved user program effects are deleted.

Snapshots

This unit's snapshot function allows you to save the control panel state, and recall it whenever necessary.
You can save up to one hundred control panel states in snapshot registers in the processor numbered from 0 to 99.
When you recall a saved snapshot, the control panel settings all change automatically.
The following are the settings which you can save in a snapshot.

Operational section	Settings
Primary cross-point bus section	Signal selected by the FOREGROUND bus buttons
	Signal selected by the BACKGROUND bus buttons
	Signal selected by the TITLE1 SOURCE bus button
	Signal selected by the TITLE2 SOURCE bus button
	Signal selected by the DSK FILL bus button
	Signal selected by the SUPER BG bus button
	Signal selected by the FRGD 2 bus button
	Signal selected by the MEMORY bus button
Effect transition section	Transition time
	Transition direction (REVERSE button setting)
	FRAME button setting
Pattern/numeric keypad	Specified pattern number
LIGHTING section	All settings
TITLE section	All settings
MATTES section	Color matte colors
DSK section	All settings
Effect control section	User modifiable effect parameter settings
EDGE section	All settings
Location section	All settings

Note

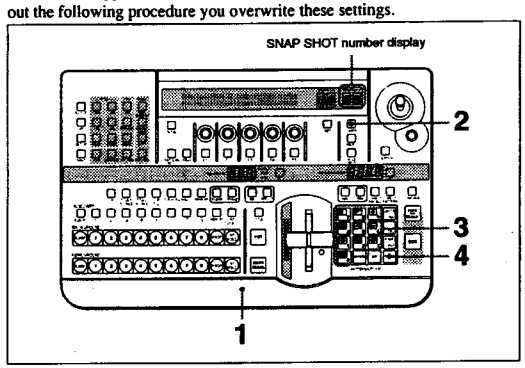
The color corrector settings and fader lever position are not saved in a snapshot.

Saving a Snapshot

To save a snapshot, use the following procedure.

Note

The unit is shipped with snapshots saved in registers 0 to 99. By carrying out the following procedure you overwrite these settings.



1 Set the buttons and controls on the control panel so that it is configured to the state you want to save.

2 Press the LEARN button.

The button lights, and the pattern/numeric keypad is ready to accept a snapshot number.

3 With the buttons 0 to 9, enter the snapshot number you want to save (0 to 99).
You can use the UP and DOWN buttons to adjust the number displayed.

4 Press the ENTER button.

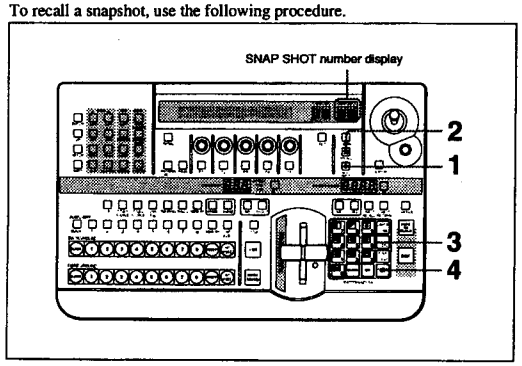
This saves the current settings in the snapshot register.

To cancel the snapshot saving operation
In step **4**, press the LEARN button instead of the ENTER button. The LEARN button goes out and the operation is canceled.

Snapshots

Recalling a Snapshot

To recall a snapshot, use the following procedure.



1 To leave the primary cross-point bus section settings unaltered, press the HOLD INPUT button, turning it on.

2 Press the RECALL button.

The button lights, and the pattern/numeric keypad is ready to accept a snapshot number.

3 With the buttons 0 to 9, enter the snapshot number you want to recall. You can use the UP and DOWN buttons to adjust the number displayed.

4 Press the ENTER button.

This recalls the specified snapshot. and the control panel settings all change correspondingly.
If, however, you turned the HOLD INPUT button on in step **1**, the settings of the primary cross-point bus section do not change.

Direct Snapshot Recall
You can recall snapshots 0 to 9 with a single button operation.

Use the following procedure.

1 In the pattern/numeric keypad, press the DIRECT RECALL button, turning it on.

This switches to direct recall mode.

2 Press the one of buttons 0 to 9 corresponding to the snapshot you want to recall.

This recalls the snapshot.

To cancel the snapshot recall operation
In step **4**, press the LEARN button instead of the ENTER button. The LEARN button goes out and the operation is canceled.

Returning to the previous image with the LAST X function
To return to the state before recalling a snapshot, use the following procedure.

1 Press the RECALL button in the snapshot section, turning it on. Alternatively, press the DIRECT RECALL button, turning it on.

2 Hold down the ENTER button in the pattern/numeric keypad, and press the LAST X button.

Snapshot Demonstration

You can automatically show all of snapshots 0 to 99 in sequence.
You can use this function for checking the snapshots, and also in the same manner as the factory setting demonstration *(see page 3-8)*.
The snapshot registers and factory setting demonstration registers are separate. Even after changing the settings in the snapshot registers, you can still run the factory setting demonstration unchanged.

To start the demonstration
Hold down buttons 1 and 9 in the pattern/numeric keypad, and press the AUTO TRANS button in the effect transition section.
This plays back the snapshots in sequence, starting from the snapshot whose number is specified at the time. During the demonstration. the buttons on the pattern/numeric keypad light in turn in the clockwise direction.

- The HOLD INPUT button setting also applies to the demonstration.
- During the demonstration. the control panel does not accept any operations other than pressing the AUTO TRANS button.

To end the demonstration
Press the AUTO TRANS button once more.

Reinitializing the Snapshots

By reinitializing the snapshot registers. you can return them all to their factory defaults.
Use the following procedure.

1 Press the SET UP button.

The setup menu appears.

2 Press the PAGE button to display page 6/8.

3 Press the F2(SNAP) button, to set it to "ON".

4 Press the F5(EXEC) button.

A confirmation message appears.

5 To go ahead and reinitialize all snapshots, press F3(OK); to cancel press F5(CANCEL).

When you press F3, all of the snapshots are returned to their factory defaults.

Chapter 5

Control From Editing Control Units

Control From the PVE-500

You can combine the DFS-700/700P with the PVE-500 Editing Control Unit to carry out A/B roll editing using two players and one recorder. The PVE-500 controls the DFS-700/700P using PVE-500 control signals and GPI signals.

Note

For details of preread editing, see the section "Preread Editing" *(page 5-14)*.

Control using PVE-500 control signals

You can control the following DFS-700/700P functions using 9-pin serial control signals from the PVE-500. Input these signals to the EDITOR connector on the rear panel of the DFS-700/700P.

- Selecting the background image (FROM source) and foreground image (TO source)
- Setting the transition duration
- Executing auto transitions
- Automatic snapshot (when you save editing data on the PVE-500, DFS-700/700P snapshots are saved and recalled automatically.)

For more information about controlling these functions. refer to the PVE-500 Operating Instructions.

Downstream key control using GPI signals

You can use GPI pulse signals from the PVE-500 to turn the DFS-700/700P downstream key function on or off on the falling edge of a pulse. Input the GPI signals to the T2 connector on the DFS-700/700P.

For details of GPI signal timing, see page 5-13.

Control From the PVE-500

Preparations

Make the following preparations to control the DFS-700/700P from the PVE-500.

On the DFS-700/700P

- In page 1 of the setup menu, set F3(PORTS) to "PVE-500".
- To accept 9-pin serial control signals, press the EDITOR button on the control panel, turning it on. To accept GPI signals, press the GPI button, turning it on.
  (When the DFS-700/700P is powered on, it accepts either 9-pin serial control signals or GPI signals.)

On the recorder VCR

- Set the recorder VCR so that it enters PB (playback) mode when stopped. (If the VCR has a selector for PB or PB/EE, set it to PB.)
- If the VCR has a built-in TBC, set the VCR to DELAYED SYNC mode.

On the PVE-500

Using the setup menu, make the following settings.

For more information about using the setup menu, refer to the PVE-5(X) Operating Instructions.

- Set the switcher type (menu item SEtUP-20) to 500. (The factory default setting is 500.)
- If you want to use the automatic snapshot function, set snapshot control (menu item SEtUP-21) to On. (The factory default setting is OFF.)

Cut Editing

To perform a cut edit by controlling the DFS-700/700P from the PVE-500, use the following procedure.
For this operation, refer also to the PVE-500 Operating Instructions.

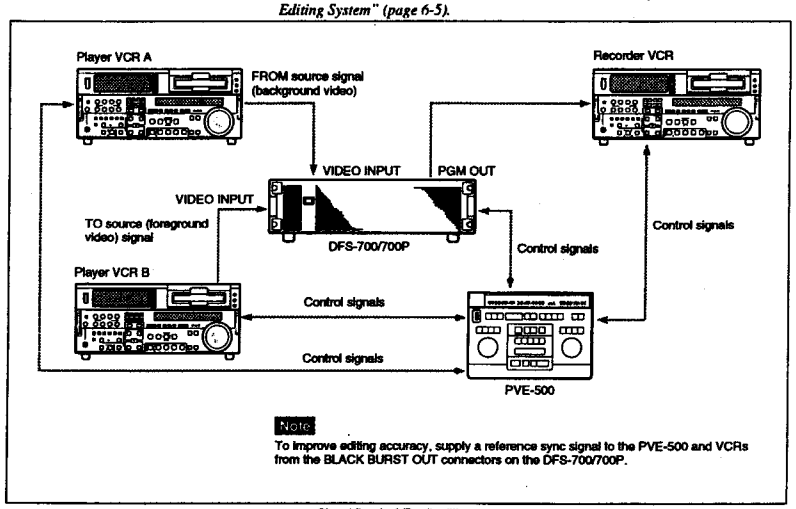
1. Press the A/B button on the PVE-500 turning it off.
2. Select the player VCR as the FROM source.
3. Set the IN and OUT points for the FROM source and recorder, in any order.
4. Conduct a preview as required, and execute the edit.

A/B Roll Editing

Signal flow

The flow of signals in A/B roll editing is shown below.

For more information about connections, see "Connections for an A/B Roll Editing System" (page 6-5).



Signal flow in A/B roll editing

Control From the PVE-500

Procedure

To perform A/B roll editing by controlling the DFS-700/700P from the PVE-500, use the following procedure.
Read this in conjunction with the PVE-500 Operating Instructions.

1 On the PVE-500, press the A/B button, turning it on.

2 On the PVE-500, select the FROM source and TO source.
The FROM source corresponds to the background on the DFS-700/700P, and the TO source corresponds to the foreground.

3 Set the IN and OUT points for the FROM source, the TO source, and the recorder, in any order.

Note

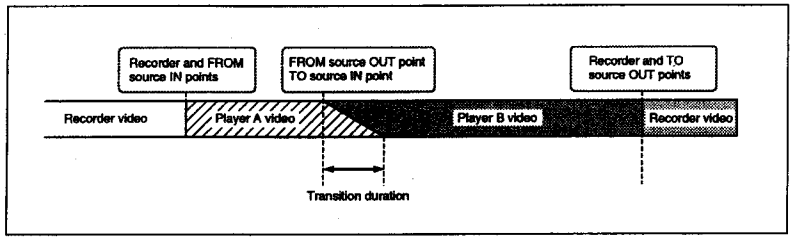
Because the DFS-700/700P has a built-in frame synchronizer, output of player VCR edit points set on the PVE-500 is delayed by 1 frame, so that recording begins with the previous frame. However, recorder edit points are not delayed.

4 On the PVE-500, press the TRANS button, turning it on, and set the transition duration.

5 On the DFS-700/700P, select the effect and make other settings as required.
Note that the transition duration set on the PVE-500 takes priority.

6 Conduct a preview as required and execute the edit.

The edit is recorded as shown below.


Recorder and FROM source IN points
FROM source OUT point TO source IN point
Recorder and TO source OUT points
Recorder video
Player A video
Player B video
Recorder video
Transition duration

Control From the BVE-600

You can combine the DFS-700/700P with a BVE-600 Editing Control Unit to carry out A/B roll editing using two players and one recorder.
The BVE-600 controls the DFS-700/700P using the GPI trigger signals T1 and T2.

Notes

- You cannot use the built-in switcher of the BVE-600 (BKE-611/612/621/622) when you are using the DFS-700/700P.
- For details of preread editing, see the section "Preread Editing" *(page 5-14)*.

Preparations

Make the following preparations to control the DFS-700/700P from the BVE-600.
For details of operation, refer to the BVE-600 Operating Instructions.

On the DFS-700/700P

- In page 1 of the setup menu, set F3(PORTS) to "BVE-600".
- Press the EDITOR button on the control panel, turning it on. (This button is lit when the DFS-700/700P is powered on.)

On the recorder VCR

- Set the recorder VCR so that it enters PB (playback) mode when stopped. (If the VCR has a selector for PB or PB/EE, set it to PB.)
- If the VCR has a built-in TBC, set the VCR to DELAYED SYNC mode.

On the BVE-600

On the rear panel, set S502 DIP switch 3 and S503 DIP switch 2 to the lower position (OFF), and power the BVE-600 on again.
When the unit is shipped from the factory, all DIP switches are set to the upper position (ON).

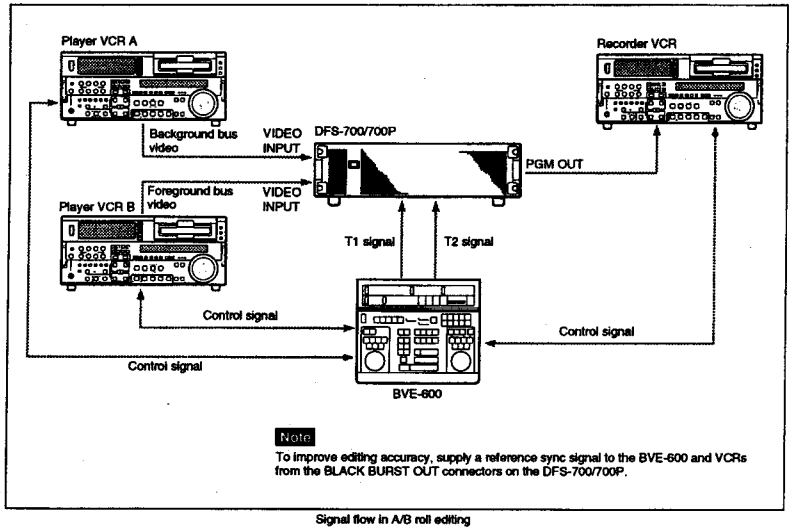
Notes

- To display the background image during or after a transition, press an appropriate BACKGROUND bus button on the DFS-700/700P.
- Because the DFS-700/700P has a built-in frame synchronizer, output of player VCR edit points set on the BVE-600 is delayed by 1 frame, so that recording begins with the previous frame. However, recorder edit points are not delayed. For example, if the IN point of the player VCR is set to 00:00:10:15, actual recording begins from 00:00:10:14.
- The timing of the start of a transition is delayed by two frames from the BVE-600 setting.

Control From the BVE-600

A/B Roll Editing

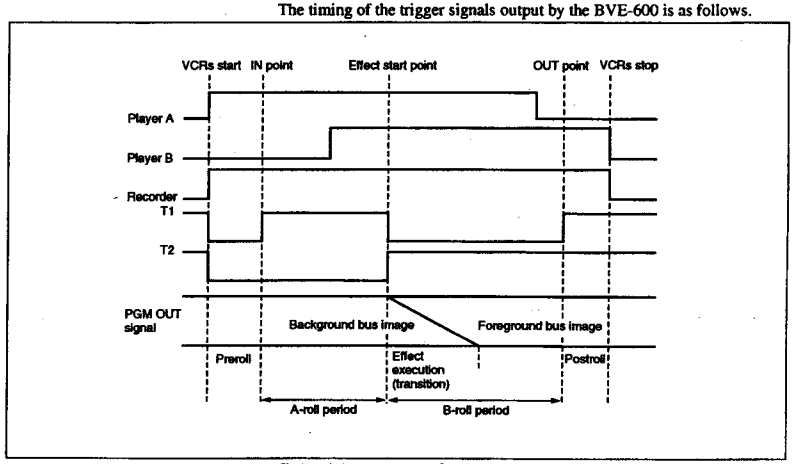
Signal flow



Signal flow in A/B roll editing

Timing of the trigger (T1/T2) signals

The timing of the trigger signals output by the BVE-600 is as follows.



Timing of trigger signals in A/B roll editing

Control From the BVE-900/2000 Series

You can combine the DFS-700/700P with a BVE-900/910 or BVE-2000 Series Editing Control Unit to carry out A/B roll editing using two players and one recorder.
For details of preread editing, see the section "Preread Editing" (page 5-14).

Connectable editing control units

To control the DFS-700/700P, the BVE-900/910/2000 and optional BKE-913 board (for BVE-900/910) must have the following ROM versions or higher.

BVE-900	Ver. 1.11 or later
BVE-900 with BKE-900K	Ver. 2.01 or later
BVE-910	Ver. 1.02 or later
BKE-913	Ver. 1.06 or later
BVE-2000	Ver. 1.10 or later

Control using editor control signals

You can control the following DFS-700/700P functions using 9-pin serial control signals from the BVE-900/910/2000. Input these signals to the EDITOR connector on the rear panel of the DFS-700/700P. The functions marked with an asterisk below can only be controlled from the BKE-900 after installation of the optional BKE-900K board.)

- Background image (FROM source) and foreground image (TO source) selection
- Pattern number selection
- Transition direction (normal or reverse) selection
- Transition duration selection
- Automatic transition execution
- Downstream key on and off
- Snapshot saving and recall*
- Saving and loading DFS-700/700P data (snapshots and user program effects)*

Notes

- It is not possible to load and save user program effects or snapshots from the BVE-900/910.
- KEY FADE IN and KEY FADE OUT cannot be used. Also, KEY WIPE OUT and KEY MIX OUT can only be used with versions 2.24 and later of the BVE-2000.
  When using KEY WIPE OUT, the effect must be executed in the reverse direction.

Downstream key control using GPI signals

You can use signals from the GPI output connector on the BVE-900/910/2000 to turn the DFS-700/700P downstream key function on and off. Input the GPI signals to the T2 connector on the rear panel of the DFS-700/700P. (The BVE-2000 can also use 9-pin serial control signals to turn the downstream key on and off and to set the transition duration.)

Preparations

Make the following preparations to control the DFS-700/700P from the BVE-900/2000-series editor.

For details about operation, refer to the Operating Instructions or User's Guide supplied with the editor.

On the DFS-700/700P

- In page 1 of the setup menu, set F3(PORTS) to "PVE-500".
- To accept 9-pin serial control signals, press the EDITOR button on the control panel, turning it on. To accept GPI signals, press the GPI button, turning it on.
  (When the DFS-700/700P is powered on, it accepts either 9-pin serial control signals or GPI signals.)
- To improve editing accuracy, supply a reference sync signal to the VCRs and editing control unit from the BLACK BURST OUT connectors on the DFS-700/700P.

On the recorder VCR

Set the recorder VCR so that it enters PB (playback) mode when stopped. (If the VCR has a selector for PB or PB/EE, set it to PB.)

On the BKE-900/910

Set the PVW (preview) mode to EE.

- **BVE-900 with no BKE-900K installed:** In SYSTEM SETUP mode, set BYTE-1 of the MAIN BLOCK INTERFACE parameters to hexadecimal "01" (EE).
- **BVE-910, or BVE-900 with BKE-900K installed:** In SYSTEM SETUP mode, set PVW MODE under SW'ER CONFIGURATION to EE.

On the BVE-2000

- In SYSTEM SETUP mode, set PVW MODE under SW'ER CONFIGURATION to EE.
- In SYSTEM SETUP mode, set SW'ER TYPE under SW'ER CONFIGURATION to DFS.
  However, for versions 2.24 and later of the BVE-2000, select DFS-700/700P.

Control From the BVE-900/2000 Series

Notes on Operation

Editing point delay

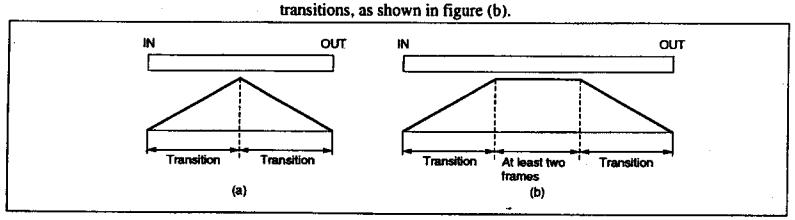
Because the DFS-700/700P has a built-in frame synchronizer, output of player VCR edit points set on the BVE-900/910/2000 is delayed by 1 frame, so that recording begins with the previous frame. However, recorder edit points are not delayed.
Example: If the IN point of the player VCR is set to 00:00:10:15, recording begins from 00:00:10:14.
If you are using a BVE-2000 with a ROM version of 2.00 or higher, in SYSTEM SETUP mode under SYSTEM CONFIGURATION you can set the DIGITAL EFFECT DELAY item to 01 so that the BVE-2000 compensates for the delay automatically.

Executing effects in the reverse direction

- To execute an effect in the reverse direction from the BVE-900/910, add 3000 to the DFS-700/700P effect pattern number. However, add 500 to the pattern numbers of user program effects (pattern numbers 9000 and above).
  Examples:
  To execute effect 25 in the reverse direction, specify pattern number 3025.
  To execute effect 9203 in the reverse direction, specify pattern number 9703.
- To execute an effect in the reverse direction from the BVE-2000, add a minus sign (–) before the DFS-700/700P pattern number.
  Example:
  To execute effect 25 in the reverse direction, specify effect pattern number –25.

Effect intervals

Effects cannot be executed if there is no interval between transitions, as shown below in figure (a).
Be sure to leave an interval of at least two frames or more between transitions, as shown in figure (b).



Minimum interval between transitions

Control Using GPI Signals

You can combine the DFS-700/700P with any editing control unit capable of GPI signal output to carry out A/B roll editing using two players and one recorder.
You can use one GPI signal to execute DFS-700/700P effects, and a second GPI signal to turn the downstream key function on and off.

Preparations

Make the following preparations to control the DFS-700/700P using GPI signals output by the editing control unit.
For details about operation, refer to the manuals supplied with your editing control unit.

On the DFS-700/700P
- In page 1 of the setup menu, set F3(PORTS) to "GPI".
- Press the EDITOR button on the control panel, turning it on.
  (This button is lit when the DFS-700/700P is powered on.)

On the recorder VCR
- Set the recorder VCR so that it enters PB (playback) mode when stopped.
  (If the VCR has a selector for PB or PB/EE, set it to PB.)
- If the VCR has a built-in TBC, set the VCR to DELAYED SYNC mode.

On the editing control unit
- Set the GPI signal output timing to 3 frames before the IN point.
- Set the GPI signal pulse length to at least 1 frame.

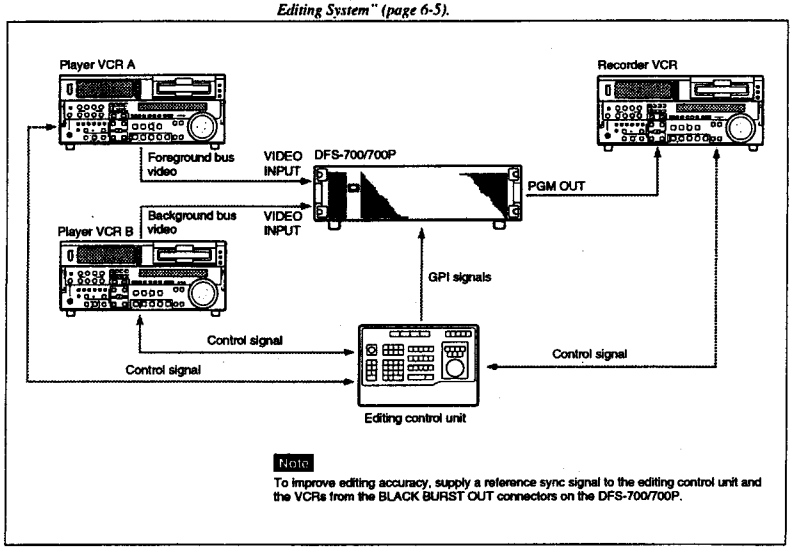
Notes
- To display the background image during or after a transition, press an appropriate BACKGROUND bus button on the DFS-700/700P.
- Because the DFS-700/700P has a built-in frame synchronizer, output of player VCR edit points set on the editing control unit is delayed by 1 frame, so that recording begins with the previous frame. However, recorder edit points are not delayed. For example, if the IN point of the player VCR is set to 00:00:10:15, recording begins from 00:00:10:14.

A/B Roll Editing

Signal flow

The flow of signals in A/B roll editing is as follows.

For more information about connections, "see Connections for an A/B Roll Editing System" (page 6-5).



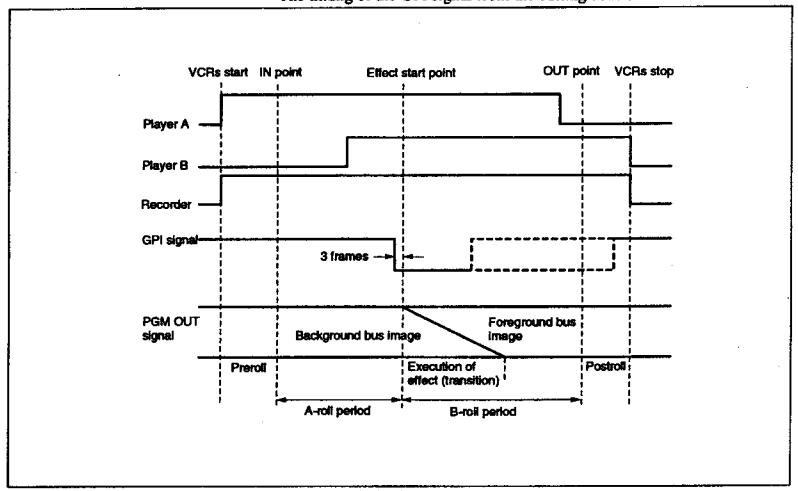
Note

To improve editing accuracy, supply a reference sync signal to the editing control unit and the VCRs from the BLACK BURST OUT connectors on the DFS-700/700P.

Signal flow in A/B roll editing

Timing of the GPI signal

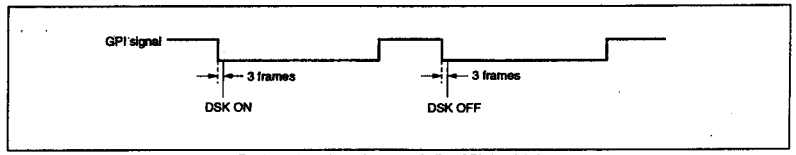
The timing of the GPI signal from the editing control unit is as follows.



Timing of GPI signal in A/B roll editing

Turning a Downstream Key On and Off

If in page 1 of the setup menu you have set F3(PORTS) to "PVE-500" or "GPI" then you can turn a downstream key on and off using a GPI signal input to the T2 connector on the DFS-700/700P.
As shown below, the downstream key is turned alternately on and off at the falling edge of the GPI signal.



Turning a downstream key on and off — GPI signal timing

Preread Editing

Notes on preread editing

- A BVE-2000 Ver. 2.24 or later is recommended as the editor.
  In this case, set PREVIEW MODE to FULL, and use a monitor connected to the DFS-700 PROGRAM OUT.
  If using a BVE-2000 earlier than Ver. 2.24 or another editor, previewing is not possible.
- It is not possible to set the DFS-700 preread mode from the editor.
  It must be set manually.
  For an editor other than the BVE-2000, it is not possible to set the preread mode for the VTR. It must be set manually.
- During preread editing, the effect patterns which can be used are restricted to those for which a title can be used automatically.
- During normal editing the video output is delayed by one frame, but during preread editing, the video selected on the background bus only is delayed by 4H.
  When carrying out R to P or P to R editing make sure that the background bus signal is available to the R.
- To obtain the DFS-700/700P program output, use digital PGM OUT or analog component PGM OUT connectors on the DFS-700/700P processor unit.

Settings for preread editing

Preparations on the DFS-700/700P

In page 1 of the setup menu, set F2(PRE_RD) to ON. When PRE_RD is set to ON, a "P" appears at the beginning of line 2 of the menu display, indicating preread mode. (Except during preread editing, if PRE_RD is set to ON the edit points will be shifted, so be sure to set it to OFF. It is not possible to make this setting from the editor.)

Preparations on a BVE-2000 earlier than Ver. 2.24

Set AUX F7(PREREAD) to ON.

Preparations on a BVE-2000 Ver. 2.24 or later

- In SYSTEM SETUP mode set the PREVIEW MODE of SW'ER CONFIGURATION to FULL.
- Set AUX F7(PREREAD) to ON.
- In SYSTEM SETUP mode set the DIGITAL EFFECT DELAY of SYSTEM CONFIGURATION to 01.

Chapter 6

System Connections and Settings

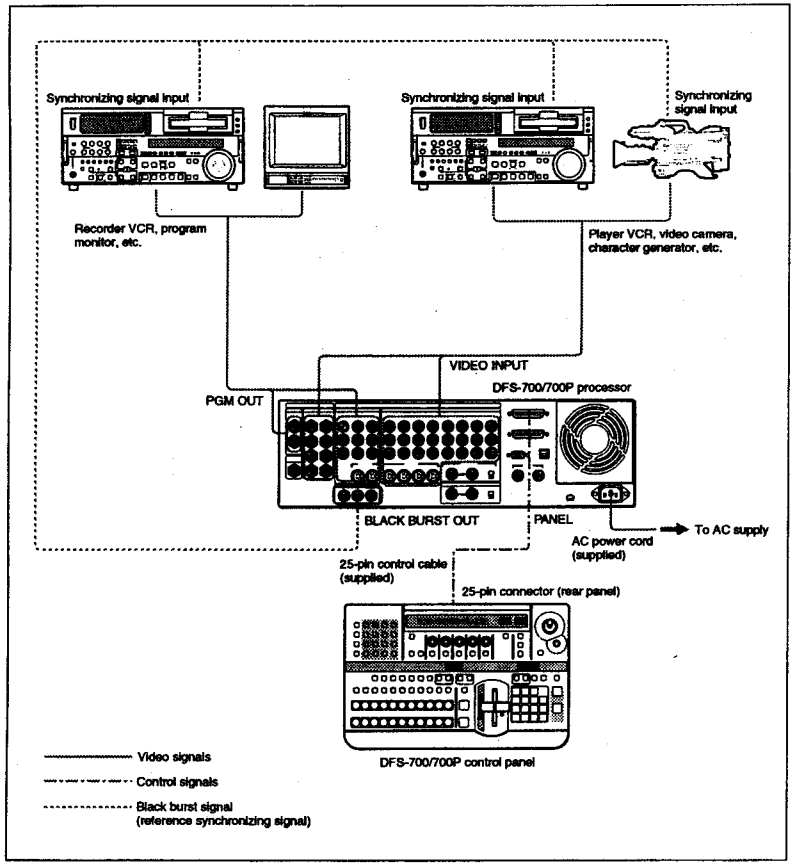
This section describes how to connect the DFS-700/700P to other equipment. It also lists the setup operations required before you can use the DFS-700/700P.

Note

Before making connections, ensure that all of the devices are powered off.

Basic System Connections

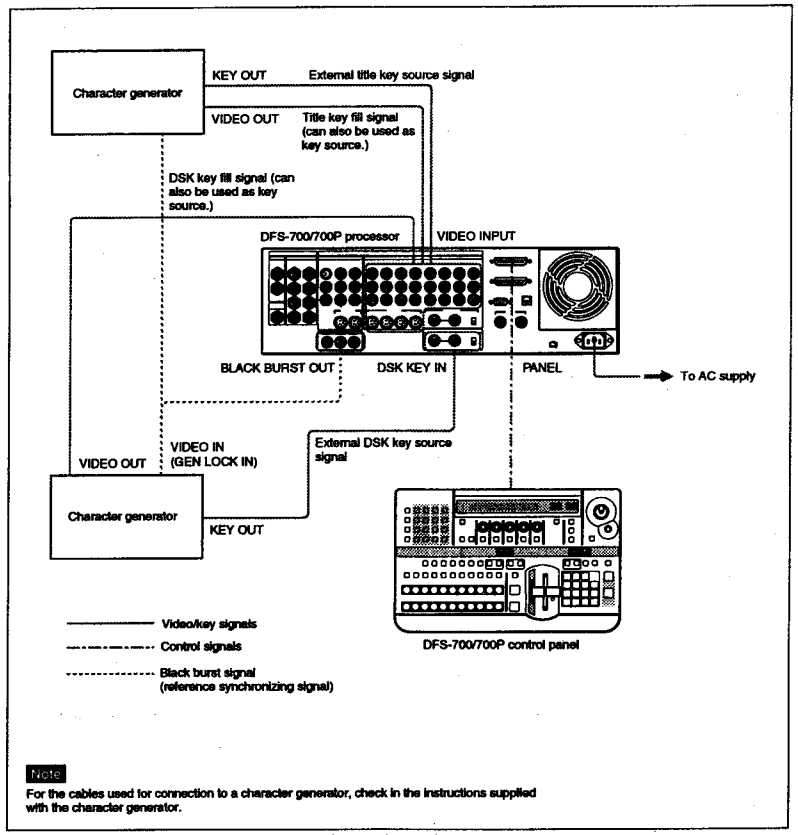
The following are the connections required for basic image creation with the DFS-700/700P.



Basic system connections

Key Signal Connections

These connections are for the signals for title keys and downstream keys (DSK) for inserting text and graphics.



Note

For the cables used for connection to a character generator, check in the instructions supplied with the character generator.

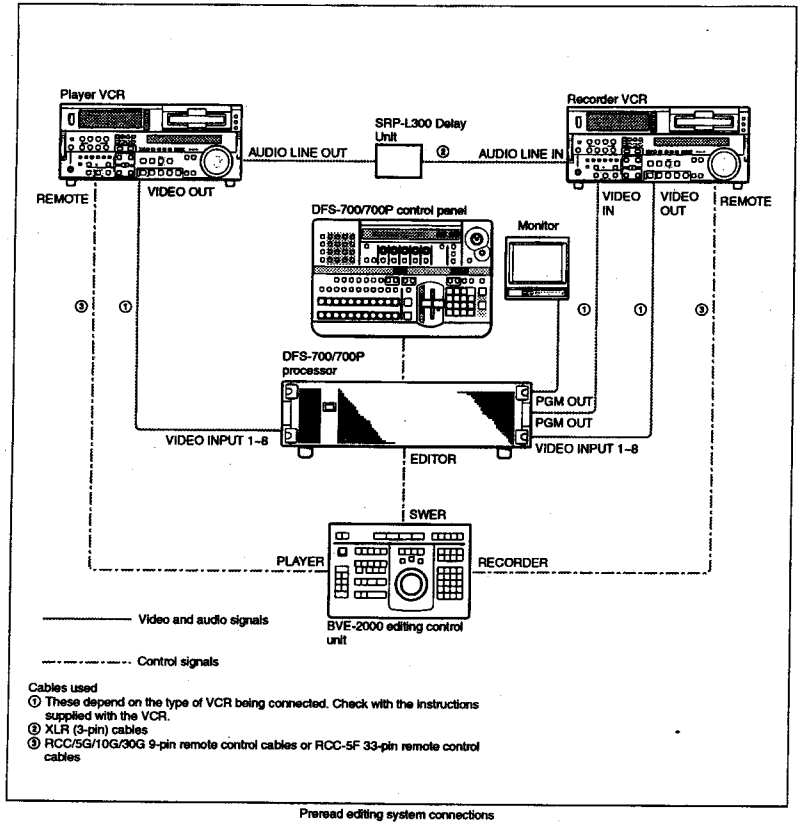
Key signal connections

System Connections for Preread Editing

By combining a BVE-2000 editing control unit and a VCR capable of preread editing (such as the DSR-2000), you can build a preread editing system.

Note

The video from the player VCR is delayed by one frame in the DFS-700/700P, and therefore playback advanced by one frame is required.



Cables used
① These depend on the type of VCR being connected. Check with the instructions supplied with the VCR.
② XLR (3-pin) cables
③ RCC/5G/10G/30G 9-pin remote control cables or RCC-5F 33-pin remote control cables

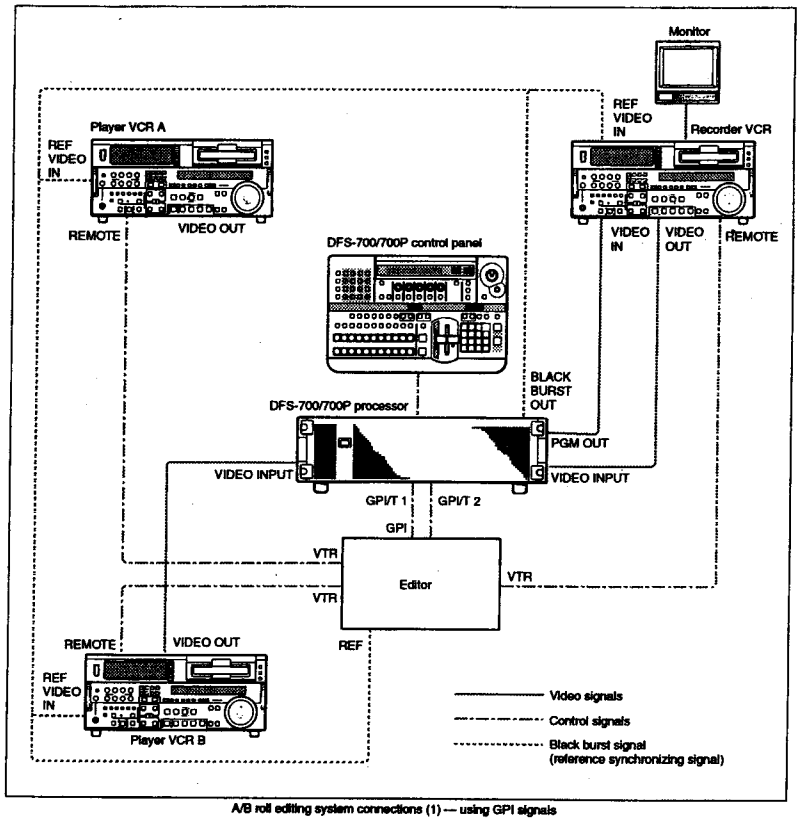
Preread editing system connections

Connections for an A/B Roll Editing System

By combining a BVE-2000 or PVE-500 editing control unit with the DFS-700 and two players and one recorder VCR, you can build an A/B roll editing system. Using an editor with GPI signal support, A/B roll editing controlled by GPI signals is also possible.

When using GPI signals

Control the M/E through the GPI/T1 connector, and the downstream keyer through the GPI/T2 connector. You can control M/E and downstream keys simultaneously.

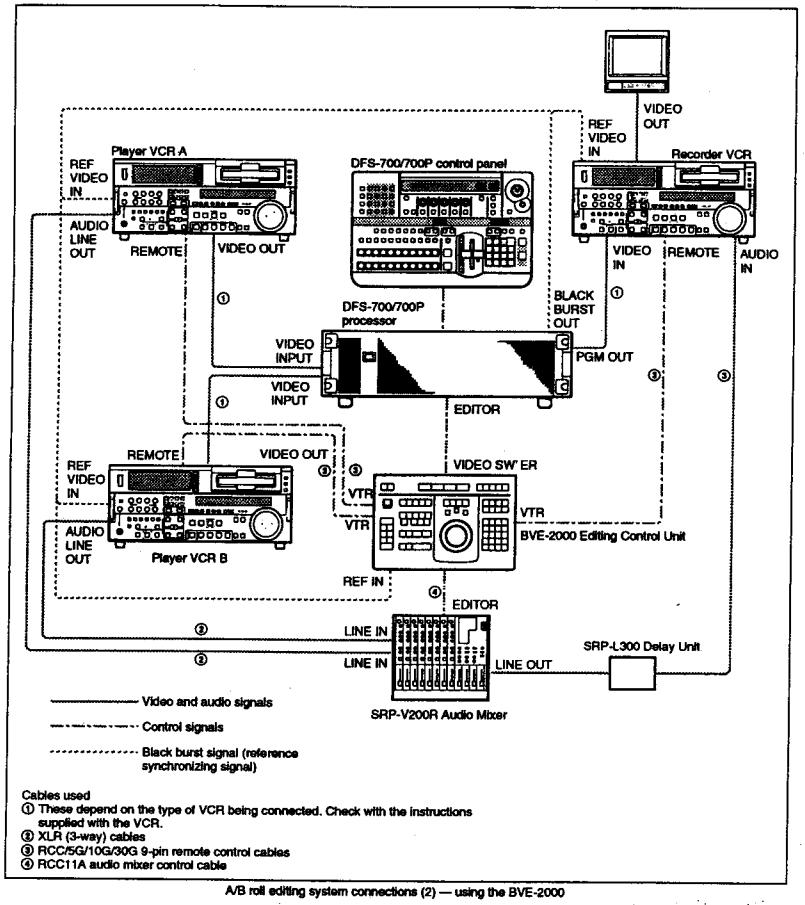


A/B roll editing system connections (1) — using GPI signals

Connections for an A/B Roll Editing System

When using the BVE-2000

Control the M/E and downstream keyer through the 9-pin connector. You can control M/E and downstream keys simultaneously.



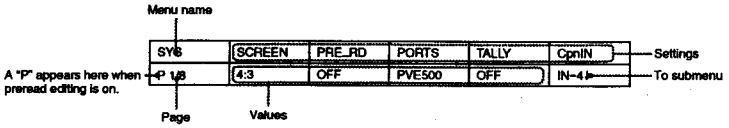
Cables used
① These depend on the type of VCR being connected. Check with the instructions supplied with the VCR.
② XLR (3-way) cables
③ RCC/5G/10G/30G 9-pin remote control cables
④ RCC11A audio mixer control cable

A/B roll editing system connections (2) — using the BVE-2000

Setup Menu Settings

Setup Menu Organization

The setup menu is divided into eight pages, and each appears as shown in the following example.
Example display:



System Setup (page 1/8)

Button	Setting	Meaning		Values (First value is factory default.)
F1	SCREEN	Set screen aspect ratio.		4:3/16:9
F2	PRE RD	Toggle preread editing on/off. When this is on, a "P" appears at the beginning of line two of the menu display.		OFF/ON
F3	PORTS	Select type of editor connected to EDITOR connector. (See table below.)		PVE-500/BVE-600/GPI (Select "PVE500" when a BVE-2000 is connected.)
F4	TALLY	Toggle rear panel tally output signal on/off.		OFF/ON
F5	CpnIN (Only appears when optional BKDF-702/702P is installed.)	Assignment of numbers to rear panel COMPONENT connectors ¹/₁ to ⁴/₄	IN1-4 ↓: assign 1 to 4.	1-4/5-8 To confirm displayed assignment, press F3(OK); to cancel press F5(CANCEL).
			IN5-8 ↓: assign 5 to 8.	

F3(PORTS) setting and control

Values	Valid control for each connector		
	EDITOR connector	GPI/T 1	GPI/T 2
PVE-500	DVS control	–	DSK transitions
BVE-600	–	Auto transitions	
GPI	–	Auto transitions	DSK transitions

Setup Menu Settings

System Information Display (page 2/8)

Button	Setting	Meaning		Values
F1	INFO	Display options installed.	CONFIG ↓	BKDF-701/711/712 (Appears as "*****" when not installed.) To return, press F5(EXIT ↓).
F2	INFO	Display software version.	VER ↓	DFS-700/700P :x.xx BKDF-712: x.xx DATA: x.xx Panel: x.xx (Appears as "----" when not installed.) To return, press F5(EXIT ↓).
F3	PW ON	Select setup mode at power on.		FACTRY (factory default)/USER (user settings)
F5	INSTL	Install new software.	↓	Press F3(OK) to confirm install; press F5(CANCEL) to cancel.

Input Video Setup (page 3/8)

Button	Setting	Meaning	Values (First value is factory default.)
F1	In No.	Select input to set.	1/2/3/4/5/6/7/8/DSK
F2	TYPE	Select input signal format.	SDI/YUV/Cps/YC/RGB/*** (Only types which can be set appear. *See the table on the next page.* When F1(In No.) is set to DSK, appears as "*****".)
F3	TBC	TBC Center setting for the input signal The output signal is output in the correct phase if the phase relationship of the center value with respect to the reference synchronizing signal is in the range ±0.3H.	0H/0.5H/1H/*** This setting is not possible when TYPE is Cps or YC.
F4	+H–pos	Video phase adjustment of input signal	• When SDI, YUV, Cps, YC, or RGB is selected, this can be adjusted from –24 to +24 in steps of 2. • When DSK is selected, this can be adjusted from –30 to +31 in steps of 1.
F5	+XPT	Cross-point button assignment to input signals	1/2/3/4/5/6/7/8/*** (When F1(In No.) is set to DSK, appears as "*****".) To assign a signal, hold down the function key, and press a cross-point button on the background bus.

Primary inputs and signal formats

SDI: serial digital signals
Component: analog component signals
Composite: analog composite signals
YC: analog YC signals
RGB: analog RGB signals (G signal with sync)

Input number	1	2	3	4	5	6	7	8
With standard equipment	SDI	SDI	SDI	SDI	Component	Component	Component	Component RGB
With BKDF-701 installed	SDI Component	SDI Component	SDI Component	SDI Component RGB	SDI Component	SDI Component	SDI Component	SDI Component
With BKDF-702/-702P installed (mode 1) [a]	SDI Component	SDI Component	SDI Component	SDI Component RGB	Composite YC	Composite YC	Composite YC	Composite YC
With BKDF-702/-702P installed (mode 2) [b]	SDI	SDI	SDI	SDI	Component Composite YC	Component Composite YC	Component Composite YC	Component RGB Composite YC

a) Setup menu item CpnIN set to "IN 1-4"
b) Setup menu item CpnIN set to "IN 5-8"

Output Video Setup (page 4/8)

Button	Setting	Meaning	Values (First value is factory default.)
F1	CLEAN	Select output video from CLEAN OUT connector.	CLEAN/KEYOUT/PVW *(See page 2-15.)*
F2	CLIP	Toggle white clip and dark clip on/off. Only valid for SDI output signals, and the SDI standard white and dark values are applied.	OFF/ON
F3	T-Area	Toggle safe title indication on preview video using CLEAN OUT connector on/off. When on, the safe title indication shows approximately 85% of the whole image area. This item appears when F1(CLEAN) is set to "PVW".	OFF/ON
F4	FLD FZ	Select the field output when the internal frame memory is set to field freeze mode.	ODD/EVEN

Setup Menu Settings

Control Panel Setup (page 5/8)

Button	Setting	Meaning	Values (First value is factory default.)
F1	BEEPER	Toggle beeper on/off.	ON/OFF ON: Beeper sounds if the fan stops, there is a power supply error, an operation error or a key pad operation. OFF: Beeper only sounds if the fan stops or there is a power supply error.
F2	BRIGHT	Brightness of control panel fluorescent indicators	LOW/HIGH
F3	SAVER	Toggle screen saver on/off. When on, the screen saver operates when there is no button operation for ten minutes.	OFF/ON
F4	FTB	Enable/disable FADE TO BLACK function. Setting DISABL makes the function not available.	ENABLE/DISABL

Initializing User Settings (page 6/8)

Button	Setting	Meaning	Values (First value is factory default.)
F1	SETUP	Initialize setup data.	OFF/ON To initialize an item, set it to "ON". It is not possible to initialize more than one item at a time.
F2	SNAP	Initialize snapshot.	
F3	USRPGM	Initialize user program effects.	
F4	KEYPAD	Initialize keypad data.	
F5	EXEC	Execute initialization selected from F1 to F4.	To initialize, press F3(OK); to cancel press F5(CANCEL).

Loading User Settings From Memory (page 7/8)

Button	Setting	Meaning	Values (First value is factory default.)
F1	SETUP	Load setup data.	OFF/ON
F2	SNAP	Load snapshot.	OFF/ON
F3	USRPGM	Load user program effects.	OFF/ON
F4	KEYPAD	Load keypad data.	OFF/ON
F5	EXEC	Execute load selected from F1 to F4.	To load, press F3(OK); to cancel press F5(CANCEL).

Saving User Settings in Memory (page 8/8)

Button	Setting	Meaning	Values (First value is factory default.)
F1	SETUP	Save setup data.	OFF/ON
F2	SNAP	Save snapshot.	OFF/ON
F3	USRPGM	Save user program effects.	OFF/ON
F4	KEYPAD	Save keypad data.	OFF/ON
F5	EXEC	Execute save selected from F1 to F4.	To save, press F3(OK); to cancel press F5(CANCEL).

Appendixes

Warning Messages

Warning messages appear in the menu display panel of the control panel when trouble occurs during operation of the DFS-700/700P.
Press the F5 (OK) button to erase the message.

Warning message format

Warning messages are displayed in the following format.

Number	Problem	What to do
011	FAN STOP!!->	Turn OFF Power

Warning Messages

Warning message list

The following warning messages are displayed.

Display	Meaning	What to do
011 FAN STOP!! ->Turn OFF Power	The processor detected that the power supply fan is stopped.	Turn off the power and check the power supply fan. If this does not solve the problem, contact a Sony service representative.
012 Power Unit Error ->Turn OFF Power	There is trouble with the power supply.	Turn off the power and check the power supply. If this does not solve the problem, contact a Sony service representative.
021 Reference Signal Error ->	Video sync signals are not being sent correctly from the main unit to the control panel.	Check the cable connection.
022 Self Diagnostic Error xxxx/xxxx -> Check on Maintenance menu	An error was detected during self diagnostics when the system was powered on. (xxxx/xxxx indicates the error status.)	Contact your vendor or a Sony service representative.
023 Software Version Mismatch -> Load the latest S/W	The processor and control panel software versions are different.	Contact your vendor or a Sony service representative.
031 Data Backup Error ->	User program, setup or other data could not be written to backup memory.	Contact your vendor or a Sony service representative.

Effect Type List

The effects provided by the DFS-700/700P are classified as follows.

Pattern No.	Types of effects	The number of available patterns				Reference page no.
		Varieties in standard configuration	Varieties with BKDF-711 installed	Varieties with BKDF-712 installed	Varieties with BKDF-711 and 712 installed	
1-676	Wipe	79	79	79	79	A-29, A-30
700-809	Matrix wipe	37	37	37	37	A-30, A-31
1000-1018	Mosaic	10	10	10	10	A-31
1020-1027	Still mirror	8	8	8	8	A-32
1030-1058	Y&C modify	10	10	10	10	A-32
1059	Cut	1	1	1	1	A-32
1065-1067	Strobe, Cinema	3	3	3	3	A-33
1075-1079	Cropping	5	5	5	5	A-33
1080	Mix	1	1	1	1	—
1100-1128	Picture-in-picture	19	19	19	19	A-33
1130, 1131	Zoom up	2	2	2	2	A-33
1150, 1151	Spotlight	2	2	2	2	A-34
1200-1207	Dynamic mirror	8	8	8	8	A-34
1210-1213	Stream	4	4	4	4	A-34
1230-1233	Accordion	4	4	4	4	A-34
1240, 1241	Multi-screen	2	2	2	2	A-35
1250-1271	Wave modulation	13	13	13	13	A-35
1280-1283	Real paint	4	4	4	4	A-35
1285-1288	Stained glass	4	4	4	4	A-35
1300-1307	Slide	8	8	8	8	A-35
1330-1394	Split slide	32	32	32	32	A-36, A-37
1500-1524	Compress	20	20	20	20	A-38
1530-1535	Expand	6	6	6	6	A-38
1600-1613	2D rotation	12	12	12	12	A-39
1620-1690	2D rotation + Compress + Slide	7	7	7	7	A-39
1700-1707	3D rotation	8	8	8	8	A-40
1730-1742	Door	6	6	6	6	A-40
1750-1753	Split 3D rotation	4	4	4	4	A-40
1760-1824	3D rotation + Compress + Slide	24	24	24	24	A-41
1850-1855	Album turn	6	6	6	6	A-42
1900-1964	Flip, Tumble	33	33	33	33	A-42, A-43
2000-2006	Twist	4	4	4	4	A-43
2100-2144	Page turn	40	40	40	40	A-44
2150-2154	Page turn (modified)	5	5	5	5	A-45
2160-2167	Split page turn	8	8	8	8	A-45
2200-2251	Sphere	11	11	11	11	A-45
2260-2269	Ripple	10	10	10	10	A-46
2270-2279	Burst, Explosion, Ring, Swirl	10	10	10	10	A-46
2280-2284	Amoeba, Melt, Lens	5	5	5	5	A-47

(continued)

Effect Type List

Pattern No.	Types of effects	The number of available patterns				Reference page no.
		Varieties in standard configuration	Varieties with BKDF-711 installed	Varieties with BKDF-712 installed	Varieties with BKDF-711 and 712 installed	
2300-2307	Two-picture slide	0	8	0	8	A-47
2320-2329	Two-picture slide, 2D rotation	0	10	0	10	A-47
2340-2357	Two-picture rotation + Compress + Slide	0	18	0	18	A-48
2360-2375	Two-picture intersect	0	12	0	12	A-49
2380-2395	Two-picture box	0	16	0	16	A-50
2400-2419	Two-picture brick	0	18	0	18	A-51
2420-2437	Two-picture brick (flip type)	0	18	0	18	A-52
2470-2473	Split 3D rotation	0	4	0	4	A-52
2480-2499	Masked flip	0	20	0	20	A-53
2500-2519	2ch picture-in-picture	0	20	0	20	A-54
2520-2534	2ch picture-in-picture	0	13	0	13	A-55
2550-2554	Two-picture page turn	0	5	0	5	A-55
2560-2564	Split page turn	0	5	0	5	A-56
2600-2625	3D split	0	0	10	10	A-56
2630-2633	3D split flip	0	0	4	4	A-57
2640-2651	Multi-cube	0	0	9	9	A-57
2660, 2661	Three-picture multi-cube	0	0	0	2	A-57
2690-2692	Special wipe	0	0	3	3	A-58
2700-2715	3D page turn	0	0	12	12	A-58
2720-2724	3D twist	0	0	5	5	A-58
2730-2739	3D box twist	0	0	10	10	A-59
2740-2752	3D modeling effect	0	0	4	4	A-59
2800-2805	3D beveled edge, Picture-in-picture	0	0	6	6	A-60
2810-2813	3D modeled edge, Picture-in-picture	0	0	4	4	A-60
2820-2827	3D cube, 3D brick	0	0	8	8	A-60
2830-2833	3D cube	0	0	0	4	A-60
2840-2845	3D cylinder, Sphere, Heart	0	0	6	6	A-61
2850-2857	3D wave, 3D flag	0	0	8	8	A-61
2860, 2861	Kaleidoscope	0	0	2	2	A-61
2865, 2866	3D crystal, Mirror cube	0	0	2	2	A-61
2870-2881	3D object effect	0	0	9	9	A-62
9000-9009	Linear user program (transition)	10	10	10	10	4-4
9100-9109	Linear user program (animation)	10	10	10	10	4-4
9200-9209	Nonlinear user program (transition)	10	10	10	10	4-4
9300-9309	Nonlinear user program (animation)	10	10	10	10	4-4

Effect Control Parameter List

You can change effect pattern parameters by using the pattern adjustment knobs, joystick, and Z-knob on the control panel.

F1 to F5: Menu page 1
F6 to F10: Menu page 2
F11 to F15: Menu page 3
X/Y: Joystick
Z: Z-knob

Effect control parameters

Pattern No.	Effect type and adjustable parameters
0017	Wipe
0018	F2: Rotation angle (Angle = 0 to 99)
	F3: Rotation speed (Rot = 0 to 100)
	F4: Auto center (CENTER = AUTO/FIX)
0021 to 0029	Wipe
0034 to 0039	F1: Pattern aspect ratio (Aspect = Taller to wider)
	F2: Rotation angle (Angle = 0 to 99)
	F3: Rotation speed (Rot = 0 to 100)
	F4: Auto center (CENTER = AUTO/FIX)
1010 1011	User mosaic
	F1: Size of a mosaic cell (Size = 0 to 100)
	F2: Aspect ratio of a mosaic cell (Aspect = Wider to taller)
	F3: Softness (Soft = 0 to 100)
	F5 : Type of cell (TYPE = FLAT, GLASS 1 to GLASS 4)
1015 to 1018	Pattern mosaic
	F1: Size of a mosaic cell (Size = 0 to 100)
	F2: Aspect ratio of a mosaic cell (Aspect = Wider to taller)
	F3: Softness (Soft = 0 to 100)
	F4: Aspect ratio of the mask area (MskAsp = Wider to taller)
	F5: Type of cell (TYPE = FLAT, GLASS 1 to GLASS 4)
1040 1043 1046	Y&C modify
	F1: Degree of luminance masking (PstSol = OFF, LEVEL 1 to LEVEL 7)
1050	Y&C modify
	F1: Degree of luminance masking (Poster = OFF, LEVEL 1 to LEVEL 7)
	F2: Positive/negative selection (VIDEO = NORMAL/NEGA/MONO/ MN+NEG)
	F3: Softness (Soft = 0 to 100)
1055 to 1058	Y&C modify
	F1: Degree of luminance masking (Poster = OFF, LEVEL 1 to LEVEL 7
	F2: Positive/negative selection (VIDEO = NORMAL/NEGA/MONO/ MN+NEG)
	F3: Softness (Soft = 0 to 100)
	F4: Aspect ratio of the mask area (MskAsp = Wider to taller)

(continued)

Effect Control Parameter List

Effect control parameters (continued)

Pattern No.	Effect type and adjustable parameters
1065	Strobe
	F1: Frames displayed per second (Strobe = 0 to 100)
1066 1067	Cinema
	F1: Frames displayed per second (Strobe = 0 to 100)
	F2: Wide screen degree (Wide = 0 to 100)
	F3: Wide screen position (Posi = Bottom to top)
	F4: Softness (Soft = 0 to 100)
1075 to 1079	Cropping
	F1: X-coordinate of center (Pos_X = Left to right)
	F2: Y-coordinate of center (Pos_Y = Bottom to top)
	F3: Size of pattern (Size = 0 to 100)
	F4: Aspect raito of the pattern (Aspect = Taller to wider)
1102 1103 1106 to 1109	Picture-in-picture (three-dimensional)
	F1: X-axis rotation (Rot_X = –70° to +70°)
	F2: Y-axis rotation (Rot_Y = –70° to +70°)
	F3: Z-axis rotation (Rot_Z = –70° to +70°)
	F4: Perspective (Pers = 0 to 100)
1104 1105	Picture-in-picture (skew)
	F1: Expansion and reduction along X-axis (Size_X = Small to 3 times)
	F2: Expansion and reduction along Y-axis (Size_Y = Small to 3 times)
	F3: Degree of distortion along X-axis (Skew_X = Min: No distortion) (default)
	F4: Degree of distortion along Y-axis (Skew_Y = Min: No distortion) (default)
1120 to 1128	Picture-in-picture
	F2: Display position (POS = TOP_L/TOP/TOP_R/LEFT/CENTER/RIGHT/ BTM_L/BOTTOM/BTM_R)
	F3: Picture size (Size = 0 to 100)
	F4: X-axis picture position (Pos_X = –100 to +100)
	F5: Y-axis picture position (Pos_Y = –100 to +100)
1150 1151	Spotlight
	F1: Spotlight brightness at maximum fader lever position (Shadow = Dark to bright)
	F4: Aspect ratio of the processing area (Aspect = Taller to wider)
1210 to 1213	Stream
	F1: Stream direction (Dirctn)
1250 to 1253 1270 1271	Wave modulation
	F1: Degree of modification 1 (Amp_X = 0 to 100) (1250: Modification along X-axis)
	F2: Degree of modification 2 (1250: Amp_Y = 0 to 100) (1251/1271: Angle = 0 to 99) 1250: Modification along Y-axis 1251, 1271: Direction of modification 1252, 1253, 1270: Not used
	F3: Wave cycle (Freq = 0 to 100)
	F4: Wave speed (Speed = 0 to 100)

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Effect control parameters (continued)

Pattern No.	Effect type and adjustable parameters
1280 to 1283 1285 1286	Real paint, Stained glass
	F1: Degree of paint effect (Amp = 0 to 100)
	F2: Frames per second (Strobe = 0 to 100)
	F3: Softness (Soft = 0 to 100)
	F4: Mask pattern (MASK = OFF/CIRCLE/RECT/CIRINV/RECINV)
	F5: Aspect ratio of the mask area (MskAsp = Taller to wider)
1380 to 1383 1385 to 1388	Split slide
	F1: Slide frequency (Freq = 0 to 100)
	F2: Split frequency (Angle = 0 to 99)
	F3: Z-axis rotation (Rot_Z = –100 to +100)
1390 to 1394	Split slide
	F1 :Slide frequency (Freq = 0 to 100)
1690	2D rotation + Compress + Slide (modified)
	F1: Amount of curving (Curve = 0 to 100)
	F2: Curve direction (Angle = 0 to 99)
	F3: Amount of spiral (Spiral = –100 to +100)
	F4: Z-axis rotation (Rot_Z = –100 to +100)
1750 to 1753	Split 3D rotation
	F1: Number of split (Freq = 0 to 100)
2150 to 2154	Page turn
	F1: Direction of turn (Angle = 0 to 99)
	F2: Change in turn direction (Curve = –100 to +100)
2160 to 2167	Split page turn
	F1: Number of split (Freq = 0 to 100)
2250 2251	Picture-in-picture (sphere)
	F1: Degree of modification (Amp = 0 to 100)
	F2: Z-axis rotation (Rot_Z = –100 to +100)
	F3: X-axis mapping area (Area_X = 0 to 100)
	F4: Y-axis mapping area (Area_Y = 0 to 100)

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Effect Control Parameter List

Effect control parameters (continued)

Pattern No.	Effect type and adjustable parameters
2260 to 2269	Ripple
	F1: Amplitude of modulation (Amp = 0 to 100)
	F2: Frequency of modulation (Freq = 0 to 100)
	F3: Speed of modulation (Speed = –100 to +100) (2260 to 2265 only) or area of modulation (Area = –100 to +100) (2266, 2267)
	F4: Aspect ratio of modulation (Aspect = 0 to 100)
	F5: Direction of modulation (Angle = 0 to 99)
	F6: Swirl modulation selection (SPMOD = OFF, IN, OUT) (2260 to 2265 only)
	F7: Degree of swirl modulation (Spiral = 0 to 100) (2260 to 2265 only)
2270	Burst
2271	F1: Degree of splitting (Freq = 0 to 100)
	F2: Rotation around Z axis (Rot = –100 to +100)
	F3: Degree of modulation (Spiral = –100 to +100) (2270) or area of modulation (Area = 0 to 100) (2271)
	F4: Form of modulation (FORM = RANDAM/CONST/WAVE1/WAVE2/ LINE1/LINE2/PIXEL1/P1XEL2)
2272	Broken glass
	F1: Degree of splitting (Freq = 0 to 100)
	F2: Rotation around Z axis (Rot = –100 to +100)
	F3: Splitting adjustment (Split = 0 to 100)
2273	Explosion
	F1: Stream area (AREA = NARROW/MEDIUM/WIDE/SPWIDE)
	F2: Form of modulation (FORM = RANDAM/PIXEL/LINE/WAVE1/ WAVE2/WAVE3/WAVE4/CONST)
	F3: Degree of swirl modulation (Spiral = –100 to +100)
	F4: Modulation aspect ratio (Aspect = Taller to wider)
	F5: Direction of modulation (Angle = 0 to 99)
2274	Ring
	F1: Amplitude of modulation (Amp = –100 to +100)
	F2: Degree of splitting (Freq = 0 to 100)
	F4: Modulation aspect ratio (Aspect = Taller to wider)
	F5: Direction of modulation (Angle = 0 to 99)
2275 to 2277	Swirl
	F1: Amplitude of modulation (Amp = –100 to +100)
	F4: Modulation aspect ratio (Aspect = Taller to wider)
	F5: Direction of modulation (Angle = 0 to 99)
2278	Swirl (soft rotation)
2279	F1: Degree of modulation (Soft = 0 to 100)
2280	Amoeba
	F2: Fineness of modulation (Freq = 0 to 100)
2283	Meltdown
	F1: Form of modulation (FORM = WAVE1/RAND1/WAVE2/RAND2)
	F2: Direction of modulation (TRANS = NORM1/NORM2/REV1/REV2)

(continued)

Effect control parameters (continued)

Pattern No.	Effect type and adjustable parameters
2284	Lens
	F1: Amplitude of modulation (Amp = 0 to 100)
	F2: Size of lens (Size = 0 to 100)
	F3: Form of lens (FORM = FLAT/INNER/OUTER/SPHERE)
	F4: Modulation aspect ratio (Aspect = Taller to wider)
	F5: Direction of modulation (Angle = 0 to 99)
2400 to 2407 2410 to 2419	Two-picture brick
	F1: Depth (Depth = 0 to 100)
	F3: Stretching of picture in depth section (Strch = 0 to 100)
	F4: Position of picture in depth section (Posi = –100 to +100)
2420 to 2437	Two-picture brick (flip type)
	F1: Depth (Depth = 0 to 100)
	F2: Form model (FORM = SLAB/DUAL)
	F3: Stretching of picture in depth section (Strch = 0 to 100)
	F4: Position of picture in depth section (Posi = –100 to +100)
2470 to 2473	Split 3D rotation
	F1: Fineness of splitting (Freq = 0 to 100)
2480 to 2489	Masked flip
	F1: Mask shape (PATTERN = CIRCLE/HEART/RECT/DIA/HEXA/ 5STAR/6STAR/WAVE)
	F2: Fineness of splitting (Freq = 0 to 100)
	F3: Bias of splitting (Bias = 0 to 100)
2490 to 2499	Masked flip
	F1: Mask shape (PATTERN = CHECK1/ CHECK2/ CHECK3/CHECK4/ CHECK5/LINE/RECT1/RECT2)
	F2: Mask slant (SLANT = ON/OFF)
2501 to 2507	2ch picture-in-picture
	F1: Timing at which picture appears (Delay = 0 to 100)
	F2: Picture position (POSITN = HORZ1/HORZ2/HORZ3/VERT1/VERT2/ VERT3/DIAG1/DIAG2)
	F3: Picture size (Size = 0 to 100)
	F4: Relative position on X axis (Gap_X = 0 to 100)
	F5: Relative position on Y axis (Gap_Y = 0 to 100)
2508 2509	2ch picture-in-picture
	F2: Picture positon (POSITN = HORZ1/HORZ2/HORZ3/VERT1/VERT2/ VERT3/DIAG1/DIAG2)
	F3: Picture size (Size = 0 to 100)
	F4: Relative positon on X axis (Gap_X = 0 to 100)
	F5: Relative positon on Y axis (Gap_Y = 0 to 100)

(continued)

Effect Control Parameter List

Effect control parameters (continued)

Pattern No.	Effect type and adjustable parameters
2510 to 2513	2ch picture-in-picture (with perspective, horizontal alignment)
	F1: Perspective (Pers = 0 to 100)
	F2: Y-axis size (Size_Y = 0 to 100)
	F3: Y-axis position (Pos_Y = 0 to 100)
	F4: X-axis size (Size_X = 0 to 100)
	F5: Relative position on X axis (Gap_X = 0 to 100)
2514 to 2517	2ch picture-in-picture (with perspective, vertical alignment)
	F1: Perspective (Pers = 0 to 100)
	F2: X-axis size (Size_ X = 0 to 100)
	F3: X-axis position (Pos_ X = 0 to 100)
	F4: Y-axis size (Size_Y = 0 to 100)
	F5: Relative position on Y axis (Gap_Y = 0 to 100)
2518	2ch picture-in-picture (manual)
	F1: X-axis rotation (Rot_X = –100 to +100)
	F2: Y-axis rotation (Rot_Y = –100 to +100)
	F3: Z-axis rotation (Rot_Z = –100 to +100)
	F4: Perspective (Pers = 0 to 100)
	F5: Form of picture (PTN = RECT/CIRCLE/HEART/DIA/PENTA/HEXA/ 5STAR/6STAR)
	F6: Direction of X-axis rotation (SYM RX X = ON/OFF)
	F7: Direction of Y-axis rotation (SYM RY Y = ON/OFF)
	F8: Direction of Z-axis rotation (SYM RZ Z = ON/OFF)
	F11: Relative position on X axis (Loc_X2 = –100 to +100)
	F12: Relative position on Y axis (Loc _Y2 = –100 to +100)
	F13: Relative position on z axis (Loc _Z2 = –100 to +100)
	F14: Two-picture combination type (COMBIN = ZLOC/CH1/CH2/MIX)
2519	2ch picture-in-picture (manual)
	F1: X-axis rotation (CH1) (Rot_X1 = –100 to +100)
	F2: Y-axis rotation (CH1) (Rot_Y1 = –100 to +100)
	F3: Z-axis rotation (CH1) (Rot_Z1 = –100 to +100)
	F4: Perspective (Pers = 0 to 100)
	F5: Form of picture (PTN = RECT/CIRCLE/HEART/DIA)
	F6: X-axis rotation (CH2) (Rot_X2 = –100 to +100)
	F7: Y-axis rotation (CH2) (Rot_Y2 = –100 to +100)
	F8: Z-axis rotation (CH2) (Rot_Z2 = –100 to +100)
	F11: X-axis position (CH2) (Loc_X2 = –100 to +100)
	F12: Y-axis position (CH2) (Loc_Y2 = –100 to +100)
	F13: Z-axis position (CH2) (Loc_Z2 = –100 to +100)
	F14: Two-picture combination type (COMBIN = ZLOC/CH1/CH2/MIX)
2520	2ch picture-in-picture
	F1: Delay between channels (Delay = 0 to 100)

(continued)

Effect control parameters (continued)

Pattern No.	Effect type and adjustable parameters
2521	2ch picture-in-picture (slide)
	F1: Delay between channels (Delay = 0 to 100)
	F2: Direction of picture movement (CH1) (1CHDIR = LEFT/RIGHT/TOP/ BOTTOM/BTM-R/BTM-L/TOP-L/TOP-R)
	F3: Direction of picture movement (CH2) (2CHDIR = LEFT/RIGHT/TOP/ BOTTOM/BTM-R/BTM-L/TOP-L/TOP-R)
2522	2ch picture-in-picture
	F1: Delay between channels (Delay = 0 to 100)
	F2: Direction of picture movement (CH1) (1CHDIR = LEFT/RIGHT/TOP/ BOTTOM/BTM-R/BTM-L/TOP-L/TOP-R)
	F3: Direction of picture movement (CH2) (2CHDIR = LEFT/RIGHT/TOP/ BOTTOM/BTM-R/BTM-L/TOP-L/TOP-R)
2523	2ch picture-in-picture (compressed, expanded)
2524	F1: Delay between channels (Delay = 0 to 100)
	F2: Direction of picture movement (CH1) (1CHDIR = LEFT/RIGHT/TOP/ BOTTOM/HORZ/VERT)
	F3: Direction of picture movement (CH2) (2CHDIR = LEFT/RIGHT/TOP/ BOTTOM/HORZ/VERT)
2525	2ch picture-in-picture
	F1: Delay between channels (Delay = 0 to 100)
	F2: Direction of picture movement (CH1) (1CHDIR = LEFT/RIGHT/TOP/ BOTTOM)
	F3: Direction of picture movement (CH2) (2CHDIR = LEFT/RIGHT/TOP/ BOTTOM)
	F4: Direction of effect (CH1) (1chAng = –100 to +100)
	F5: Direction of effect (CH2) (2chAng = –100 to +100)
2526	2ch picture-in-picture
	F1: Delay between channels (Delay = 0 to 100)
	F2: Direction of picture movement (CH1) (1CHROT = TOP-L1/ TOP-L2/ TOP-R1 /TOP-R2/BTM-R1/ BTM-R2/BTM-L1/ BTM-L2)
	F3: Direction of picture movement (CH2) (2CHROT = TOP-L1/ TOP-L2/ TOP-R1 /TOP-R2/BTM-R1/ BTM-R2/BTM-L1/ BTM-L2)
2527	2ch picture-in-picture
	F1: Delay between channels (Delay = 0 to 100)
	F2: Direction of picture movement (CH1) (1CHROT = TOP1/ TOP2/ BTM1/ BTM2/LEFT1/LEFT2/RIGHT1/RIGHT2)
	F3: Direction of picture movement (CH2) (2CHROT = TOP1/ TOP2/ BTM1/ BTM2/LEFT1/LEFT2/RIGHT1/RIGHT2)
2530	2ch picture-in-picture
2531	F1: Delay between channels (Delay = 0 to 100)
	F2: Direction of picture movement (CH1) (ROTDIR = PLUS/MINUS)
	F3: Perspective (Pers = 0 to 100)
2532	2ch picture-in-picture
	F1: Delay between channels (Delay = 0 to 100)
	F2: Speed of rotation (Rot = –100 to +100)

(continued)

Effect Control Parameter List

Effect control parameters (continued)

Pattern No.	Effect type and adjustable parameters
2533	2ch picture-in-picture
2534	F1: Delay between channels (Delay = 0 to 100) F2: Speed of rotation (Rot = –100 to +100) F3: Perspective (Pers = 0 to 100)
2550 to 2554	Two-picture (front, reverse) page turn
	F1: Direction of turn (Angle = 0 to 99) F2: Change in turn direction (Curve = –100 to +100)
2560 to 2564	Split page turn
	F1: Direction of turn (Angle = 0 to 99) F2: Change in turn direction (Curve = –100 to +100) F3: Type of turn (DIVTYP = VERT1/VERT2/HORZ1/HORZ2)
2624	3D split
2625	F1: Speed at which cracks spread (Speed = 0 to100) F2: Degree to which fragments fly away (Fly = 0 to 100) X/Y: Move the break center point
2630	3D split flip
2631	F1: Direction of flip (Angle = 0 to 99) F2: Area of the part that flips (Area = 0 to 100) F3: Amount of randomness in flip (Rand = 0 to 100) F4: X direction divisions (Div_X = 1 to 16) F5: Y direction divisions (Div_Y = 1 to 16) F6: Amount of X-axis rotation (Rot_X = –100 to +100) F7: Amount of Y-axis rotation (Rot_Y = –100 to +100) F8: Amount of Z-axis rotation (Rot_Z = –100 to +100) F9: Perspective (Pers = 0 to 100) F10: Delay before start of flip (Delay = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2632	3D split flip
2633	F1: Direction of split (Angle = 0 to 99) F2: Change in direction of split (Curve = –100 to +100) F3: Area of the part that splits (Area = 0 to 100) F4: Split frequency (Freq = 0 to 100) F6: Amount of X-axis rotation (Rot_X = –100 to +100) F7: Amount of Y-axis rotation (Rot_Y = –100 to +100) F8: Amount of Z-axis rotation (Rot_Z = –100 to +100) F9: Perspective (Pers = 0 to 100) F10: Delay before start of split (Delay = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2690	Special wipe
	F1: Width of crystal (Width = 0 to 100) F2: Angle of wipe (Angle = 0 to 99) F3: Refractive index of crystal (Refrct = 0 to 100)
2691	Special wipe
2692	F1: Angle of wipe (Angle = 0 to 99) F2: Degree of edge curve (Angle = 0 to 99) X/Y: Move the center point

(continued)

Effect control parameters (continued)

Pattern No.	Effect type and adjustable parameters
2700	3D page turn
2701	F1: Direction of turn (Angle = 0 to 99) F2: Change in turn direction (Curve = –100 to +100) F3: Radius of turn (Radius = 0 to 100) F4: Adjustment of effect end position (EndAdj= –100 to +100) F6: Amount of X-axis rotation (Rot_X = –100 to +100) F7: Amount of Y-axis rotation (Rot_Y = –100 to +100) F8: Amount of Z-axis rotation (Rot_Z = –100 to +100) F9: Perspective (Pers = 0 to 100) F10: Delay before start of turn (Delay = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2702	3D page turn
2703	F1: Direction of turn (Angle = 0 to 99) F2: Change in turn direction (Curve = –100 to +100) F3: Radius of turn (Radius = 0 to 100) F4: Adjustment of effect end position (EndAdj= –100 to +100) F5: Type of division (TYPE = HORZ1/HORZ2/VERT1/VERT2) F6: Amount of X-axis rotation (Rot_X = –100 to +100) F7: Amount of Y-axis rotation (Rot_Y = –100 to +100) F8: Amount of Z-axis rotation (Rot_Z = –100 to +100) F9: Perspective (Pers = 0 to 100) F10: Delay before start of turn (Delay = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2704	3D page turn
2705	F1: Direction of turn (Angle = 0 to 99) F2: Spread in turn direction (Spread = –100 to +100) F3: Radius of turn (Radius = 0 to 100) F4: Adjustment of effect end position (EndAdj= –100 to +100) F5: Type of division (TYPE = HORZ/VERT) F6: Amount of X-axis rotation (Rot_X = –100 to +100) F7: Amount of Y-axis rotation (Rot_Y = –100 to +100) F8: Amount of Z-axis rotation (Rot_Z = –100 to +100) F9: Perspective (Pers = 0 to 100) F10: Delay before start of turn (Delay = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern

(continued)

Effect Control Parameter List

Effect control parameters (continued)

Pattern No.	Effect type and adjustable parameters
2710	3D page turn
2711	F1: Direction of turn (Angle = 0 to 100) F2: Change in turn direction (Curve = –100 to +100) F3: Radius of turn (Radius = 0 to 100) F4: Adjustment of effect end position (EndAdj= –100 to +100) F6: Amount of X-axis rotation (Rot_X = –100 to +100) F7: Amount of Y-axis rotation (Rot_Y = –100 to +100) F8: Amount of Z-axis rotation (Rot_Z = –100 to +100) F9: Perspective (Pers = 0 to 100) F10: Delay before start of turn (Delay = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2712	3D page turn
2713	F3: Radius of turn (Radius = 0 to 100) F4: Adjustment of effect end position (EndAdj= –100 to +100) F6: Amount of X-axis rotation (Rot_X = –100 to +100) F7: Amount of Y-axis rotation (Rot_Y = –100 to +100) F8: Amount of Z-axis rotation (Rot_Z = –100 to +100) F9: Perspective (Pers = 0 to 100) F10: Delay before start of turn (Delay = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2714	3D page turn
2715	F3: Radius of turn (Radius = 0 to 100) F4: Adjustment of effect end position (EndAdj= –100 to +100) F6: Amount of X-axis rotation (Rot_X = –100 to +100) F7: Amount of Y-axis rotation (Rot_Y = –100 to +100) F8: Amount of Z-axis rotation (Rot_Z = –100 to +100) F9: Perspective (Pers = 0 to 100) F10: Delay before start of turn (Delay = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2720	3D twist
	F1: Direction of twist (Angle = 0 to 99) F2: Change in twist direction (Curve = –100 to +100) F3: Area of the part that twists (Area = 0 to 100) F6: Amount of X-axis rotation (Rot_X = –100 to +100) F7: Amount of Y-axis rotation (Rot_Y = –100 to +100) F8: Amount of Z-axis rotation (Rot_Z = –100 to +100) F9: Perspective (Pers = 0 to 100) F10: Delay before start of twist (Delay = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2721 to 2724	3D twist
	F3: Area of the part that twists (Area = 0 to 100) F4: Type of twist (TYPE = TYPE01/TYPE02/TYPE03/TYPE04) F6: Amount of X-axis rotation (Rot_X = –100 to +100) F7: Amount of Y-axis rotation (Rot_Y = –100 to +100) F8: Amount of Z-axis rotation (Rot_Z = –100 to +100) F9: Perspective (Pers = 0 to 100) F10: Delay before start of twist (Delay = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern

(continued)

Effect control parameters (continued)

Pattern No.	Effect type and adjustable parameters
2730 to 2739	3D box twist
	F3: Area of the part that twists (Area = 0 to 100) F4: Type of twist (TYPE = TYPE01/TYPE02/TYPE03/TYPE04) F5: Delay before start of twist (Delay = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2750	3D modeling effect
	F1: Amplitude of swirl (Amp = 0 to 100) F2: X-axis rotation of path into swirl (Path_X = –100 to +100) F3: Y-axis rotation of path into swirl (Path_Y = –100 to +100) F4: Z-axis rotation of path into swirl (Path_Z = –100 to +100)
2800 to 2805	3D beveled edge, Picture-in-picture
	F1: Amount of X-axis rotation (Rot_X = –100 to +100) F2: Amount of Y-axis rotation (Rot_Y = –100 to +100) F3: Amount of Z-axis rotation (Rot_Z = –100 to +100) F4: Perspective (Pers = 0 to 100) F5: Bevel frame type (TYPE = TYPE01 to TYPE10) F6: Width of frame (Width = 0 to 100) F10: Position of light source (Light = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2810 to 2813	3D modeled edge, Picture-in-picture
	F1: Amount of X-axis rotation (Rot_X = –100 to +100) F2: Amount of Y-axis rotation (Rot_Y = –100 to +100) F3: Amount of Z-axis rotation (Rot_Z = –100 to +100) F4: Perspective (Pers = 0 to 100) F5: Border frame type (TYPE = TYPE01 to TYPE04) F6: Width of frame (Width = 0 to 100) F7: Length of protruding part of frame (Length = 0 to 100) F8: Sharpness of frame edges (Sharp = 0 to 100)(2810 and 2811 only) F9: Position in the depth direction of the picture (Depth = 0 to 100) F10: Position of light source (Light = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern

(continued)

Effect Control Parameter List

Effect control parameters (continued)

Pattern No.	Effect type and adjustable parameters
2820	3D two-picture cube
2821	F1: Amount of X-axis rotation (Rot_X = –100 to +100) F2: Amount of Y-axis rotation (Rot_Y = –100 to +100) F3: Amount of Z-axis rotation (Rot_Z = –100 to +100) F4: Perspective (Pers = 0 to 100) F5: Frame type (TYPE = TYPE01 to TYPE04/OFF) F6: Cube degree (Cube = 0 to 100) F7: Stretching of picture in X-axis direction (Strtch = 0 to 100) F8: Position in X-axis direction (Posi = –100 to +100) F9: Width of frame (Width = 0 to 100) F10: Position of light source (Light = –100 to +100) F11: Amount of X-axis auto rotation (Spd_X = –100 to +100) F12: Amount of Y-axis auto rotation (Spd_Y = –100 to +100) F13: Amount of Z-axis auto rotation (Spd_Z = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2822	3D one-picture cube
2823	F1: Amount of X-axis rotation (Rot_X = –100 to +100) F2: Amount of Y-axis rotation (Rot_Y = –100 to +100) F3: Amount of Z-axis rotation (Rot_Z = –100 to +100) F4: Perspective (Pers = 0 to 100) F5: Frame type (TYPE = TYPE01 to TYPE04/OFF) F6: Cube degree (Cube = 0 to 100) F7: Stretching of picture in X-axis direction (Strtch = 0 to 100) F8: Position in X-axis direction (Posi = –100 to +100) F9: Width of frame (Width = 0 to 100) F10: Position of light source (Light = –100 to +100) F11: Amount of X-axis auto rotation (Spd_X = –100 to +100) F12: Amount of Y-axis auto rotation (Spd_Y = –100 to +100) F13: Amount of Z-axis auto rotation (Spd_Z = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2824	3D two-picture brick
2825	F1: Amount of X-axis rotation (Rot_X = –100 to +100) F2: Amount of Y-axis rotation (Rot_Y = –100 to +100) F3: Amount of Z-axis rotation (Rot_Z = –100 to +100) F4: Perspective (Pers = 0 to 100) F5: Frame type (TYPE = TYPE01 to TYPE04/OFF) F6: Height of brick (Hight = 0 to 100) F7: Stretching of brick side in Y-axis direction (Strtch = 0 to +100) F8: Position of brick side in Y-axis direction (Posi = –100 to +100) F9: Width of frame (Width = 0 to 100) F10: Position of light source (Light = –100 to +100) F11: Amount of X-axis auto rotation (Spd_X = –100 to +100) F12: Amount of Y-axis auto rotation (Spd_Y = –100 to +100) F13: Amount of Z-axis auto rotation (Spd_Z = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern

(continued)

Effect control parameters (continued)

Pattern No.	Effect type and adjustable parameters
2826	3D one-picture brick
2827	F1: Amount of X-axis rotation (Rot_X = –100 to +100) F2: Amount of Y-axis rotation (Rot_Y = –100 to +100) F3: Amount of Z-axis rotation (Rot_Z = –100 to +100) F4: Perspective (Pers = 0 to 100) F5: Frame type (TYPE = TYPE01 to TYPE04) F6: Height of brick (Hight = 0 to 100) F7: Stretching of brick side in Y-axis direction (Strtch = 0 to 100) F8: Position of brick side in Y-axis direction (Posi = –100 to +100) F9: Width of frame (Width = 0 to 100) F10: Position of light source (Light = –100 to +100) F11: Amount of X-axis auto rotation (Spd_X = –100 to +100) F12: Amount of Y-axis auto rotation (Spd_Y = –100 to +100) F13: Amount of Z-axis auto rotation (Spd_Z = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2830	3D three-picture cube
2831	F1: Amount of X-axis rotation (Rot_X = –100 to +100) F2: Amount of Y-axis rotation (Rot_Y = –100 to +100) F3: Amount of Z-axis rotation (Rot_Z = –100 to +100) F4: Perspective (Pers = 0 to 100) F5: Frame type (TYPE = TYPE01 to TYPE04/OFF) F6: Cube degree (Cube = 0 to 100) F7: Stretching of picture in X-axis direction (Strtch = 0 to 100) F8: Position in X-axis direction (Posi = –100 to +100) F9: Width of frame (Width = 0 to 100) F10: Position of light source (Light = –100 to +100) F11: Amount of X-axis auto rotation (Spd_X = –100 to +100) F12: Amount of Y-axis auto rotation (Spd_Y = –100 to +100) F13: Amount of Z-axis auto rotation (Spd_Z = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2832	3D two-picture cube
2833	F1: Amount of X-axis rotation (Rot_X = –100 to +100) F2: Amount of Y-axis rotation (Rot_Y = –100 to +100) F3: Amount of Z-axis rotation (Rot_Z = –100 to +100) F4: Perspective (Pers = 0 to 100) F5: Frame type (TYPE = TYPE01 to TYPE04/OFF) F6: Cube degree (Cube = 0 to 100) F7: Stretching of picture in X-axis direction (Strtch = 0 to 100) F8: Position in X-axis direction (Posi = –100 to +100) F9: Width of frame (Width = 0 to 100) F10: Position of light source (Light = –100 to +100) F11: Amount of X-axis auto rotation (Spd_X = –100 to +100) F12: Amount of Y-axis auto rotation (Spd_Y = –100 to +100) F13: Amount of Z-axis auto rotation (Spd_Z = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern

(continued)

Effect Control Parameter List

Effect control parameters (continued)

Pattern No.	Effect type and adjustable parameters
2840	3D cylinder
2841	F1: Amount of X-axis rotation (Rot_X = –100 to +100) F2: Amount of Y-axis rotation (Rot_Y = –100 to +100) F3: Amount of Z-axis rotation (Rot_Z = –100 to +100) F4: Fine adjustment of mapping in X-axis direction (Area_X = 0 to 100) F5: Fine adjustment of mapping in Y-axis direction (Area_Y = 0 to 100) F6: Thickness of cylinder (Radius = 0 to 100) F7: Degree of wave modulation on cylinder sides (Amp = 0 to 100) F8: Frequency of wave modulation on cylinder sides (Freq = 0 to 100) F9: Phase of wave modulation on cylinder sides (Phase = 0 to 99) F10: Position of light source (Light = –100 to +100) F11: Amount of X-axis auto rotation (Spd_X = –100 to +100) F12: Amount of Y-axis auto rotation (Spd_Y = –100 to +100) F13: Amount of Z-axis auto rotation (Spd_Z = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2842 to 2845	Sphere, Heart F1: Amount of X-axis rotation (Rot_X = –100 to +100) F2: Amount of Y-axis rotation (Rot_Y = –100 to +100) F3: Amount of Z-axis rotation (Rot_Z = –100 to +100) F4: Fine adjustment of mapping in X-axis direction (Area_X = 0 to 100) F5: Fine adjustment of mapping in Y-axis direction (Area_Y = 0 to 100) F6: Amount of X-axis auto rotation (Spd_X = –100 to +100) F7: Amount of Y-axis auto rotation (Spd_Y = –100 to +100) F8: Amount of Z-axis auto rotation (Spd_Z = –100 to +100) F10: Position of light source (Light = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2850 to 2853	3D wave F1: Amount of X-axis rotation (Rot_X = –100 to +100) F2: Amount of Y-axis rotation (Rot_Y = –100 to +100) F3: Amount of Z-axis rotation (Rot_Z = –100 to +100) F4: Perspective (Pers = 0 to 100) F5: Direction of wave modulation (Angle = 0 to 99) F6: Amplitude of wave modulation (Amp = 0 to 100) F7: Frequency of wave modulation (Freq = 0 to 100) F8: Phase of wave modulation (Phase = 0 to 99) F9: Speed of auto change in phase of wave modulation (Speed = –100 to +100) F10: Position of light source (Light = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern

(continued)

Effect control parameters (continued)

Pattern No.	Effect type and adjustable parameters
2854	3D wave
2855	F1: Amount of X-axis rotation (Rot_X = –100 to +100) F2: Amount of Y-axis rotation (Rot_Y = –100 to +100) F3: Amount of Z-axis rotation (Rot_Z = –100 to +100) F4: Perspective (Pers = 0 to 100) F5: Direction of wave modulation (Angle = 0 to 99) F6: Amplitude of wave modulation 1 (Amp1 = 0 to 100) F7: Frequency of wave modulation 1 (Freq1 = 0 to 100) F8: Phase of wave modulation 1 (Phase1 = 0 to 99) F9: Speed of auto change in phase of wave modulation 1 (Speed1 = –100 to +100) F10: Position of light source (Light = –100 to +100) F11: Amplitude of wave modulation 2 (Amp2 = 0 to 100) F12: Frequency of wave modulation 2 (Freq2 = 0 to 100) F13: Phase of wave modulation 2 (Phase2 = 0 to 99) F14: Speed of auto change in phase of wave modulation 2 (Speed2 = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2856	3D flag
2857	F1: Amount of X-axis rotation (Rot_X = –100 to +100) F2: Amount of Y-axis rotation (Rot_Y = –100 to +100) F3: Amount of Z-axis rotation (Rot_Z = –100 to +100) F4: Perspective (Pers = 0 to 100) F5: Position of pole (POLE = RIGHT/LEFT) F6: Amplitude of wave modulation (Amp = 0 to 100) F7: Change in direction of waving (Swing = 0 to 100) X/Y/Z: Location, enlargement, and reduction of the pattern
2860	Kaleidoscope F1: Size of repetition (Size = 0 to 100) F2: Amount of auto rotation (RotSpd = –100 to +100)
2865	3D crystal F1: Amount of auto repetition in X-axis rotation (Swng_X = 0 to 100) F2: Amount of auto repetition in Y-axis rotation (Swng_Y = 0 to 100) F3: Amount of auto rotation on Z-axis (Spd_Z = –100 to +100) F4: Width of beveled edge (Width = 0 to 100) F5: Height of beveled edge (Hight = 0 to 100) X/Y/Z: Location, enlargement, and reduction of the pattern
2866	Mirror cube F1: Amount of auto rotation on X-axis (Spd_X = –100 to +100) F2: Amount of auto rotation on Y-axis (Spd_Y = –100 to +100) F3: Amount of auto rotation on Z-axis (Spd_Z = –100 to +100) X/Y/Z: Location, enlargement, and reduction of the pattern
2870	3D object effects F1: Mapping mode (MapMod = POINT/FACE1/FACE2)

(continued)

Effect Control Parameter List

Effect control parameters (continued)

Pattern No.	Effect type and adjustable parameters
2871	3D object effects
to	F1: Mapping mode (MapMod = POINT/FACE1/FACE2)
2876	F2: Size of model (Size = 0 to 100)
	F3: Acceleration of fall (Accel = 0 to 100)
	F4: Snaking on X-axis (Wave_X = 0 to 100)
	F5: Snaking on Y-axis (Wave_Y = 0 to 100)
	F6: Amount of auto rotation on X-axis (Spd_X = –100 to +100)
	F7: Amount of auto rotation on Y-axis (Spd_Y = –100 to +100)
	F8: Amount of auto rotation on Z-axis (Spd_Z = –100 to +100)
	F9: Frequency of snaking on X-axis (Freq_X = 0 to 100)
	X/Y/Z: Location, enlargement, and reduction of the pattern

Effect Motion Types

The effects of the DFS-700/700P can be classified by their direction type. as follows.

Effects classified by direction type

Direction type	Characteristics	Pattern No.
Transition type	When you move the fader from one end to the other and back, the effect is executed in the same direction. Crosspoints selected with the BACKGROUND and FOREGROUND bus buttons change when the effect is executed.	1 to 1000 1003 to 1010 1059 1080 1200 to 1233 1260 to 1271 1300 to 2213 2260, 2261 2263, 2264 2266 to 2283 2300 to 2499 2550 to 2752 9000 to 9009 9200 to 9209
Animation type	• When you move the fader from one end to the other and back, the effect is executed in the opposite direction. Crosspoints selected with the BACKGROUND and FOREGROUND bus buttons do not change. • If the editing control unit select switch is set to PVE-500, the N/R button lights during execution of the effect.	1001 1011 to 1058 1065 to 1079 1100 to 1151 1130 to 1171 1240 to 1253 1280 to 1288 2250 to 2251 2262 2265 2284 2500 to 2534 2800 to 2881 9100 to 9109 9300 to 9309

Effect Pattern Variant Forms and Decorations

Some effect patterns have attributes that allow you to change them, for example by changing the position or adding a border.
The following list shows the attributes that are available for each pattern.

TITLE: Title key transition
- EDGE: Edge effects
  - BD: Border
  - SF: Blurring
  - BV: Bevel edge

CROP: Cropping
- L: Left
- R: Right
- T: Top
- B: Bottom

LOCATE: Location of the pattern
- XY: X-axis and Y-axis location
- Z: Z-axis location

LIGHTING: Lighting
- SP: Spotlighting
- LN: Direct lighting
- PL: Even lighting

TRAIL: Trail
- TR: Trail
- DB: Drop border
- DS: Drop shadow

OPTION: Options
- 711: The ☆ mark indicates that the BKDF-711 is required for this function.
- 712: The ★ mark indicates that the BKDF-712 is required for this function.

Pattern No.	TITLE	EDGE			CROP				LOCATE		LIGHTING			TRAIL			OPTION	
		BD	SF	BV	L	R	T	B	XY	Z	SP	LN	PL	TR	DB	DS	711	712
0001 to 0016	√	√	√															
0017 to 0018	√	√	√						√									
0019 to 0020	√	√	√															
0021 to 0029	√	√	√						√									
0030 to 0033	√	√	√															
0034 to 0039	√	√	√						√									
0104 to 0676	√	√	√															
0700 to 0809	√	√	√											√	√	√		
1000		√	√	√										√	√	√		
1001	√	√	√	√										√	√	√		
1003 to 1010		√	√	√										√	√	√		
1011	√	√	√	√										√	√	√		
1015 to 1018	√	√	√						√	√				√	√	√		
1020 to 1027	√	√	√	√										√	√	√		
1030 to 1050	√	√	√	√										√	√	√		
1055 to 1058	√	√	√						√	√				√	√	√		
1059	√	√	√	√														
1065	√	√	√	√										√	√	√		
1066 to 1067	√	√	√						√					√	√	√		
1075 to 1079	√	√	√						√	√				√	√	√		
1080	√	√	√	√										√	√	√		
1100 to 1101	√	√	√	√	√	√	√	√	√					√	√	√		
1102 to 1105	√	√	√	√	√	√	√	√	√	√				√	√	√		
1106 to 1109	√	√	√		√	√	√	√	√	√				√	√	√		
1120 to 1128	√	√	√	√	√	√	√	√						√	√	√		
1130 to 1131	√	√	√	√	√	√	√	√	√					√	√	√		
1150 to 1151	√	√	√						√	√				√	√	√		
1200	√	√	√	√		√								√	√	√		
1201	√	√	√	√	√									√	√	√		

Pattern No.	TITLE	EDGE			CROP				LOCATE		LIGHTING			TRAIL			OPTION	
		BD	SF	BV	L	R	T	B	XY	Z	SP	LN	PL	TR	DB	DS	711	712
1202	√	√	√	√				√						√	√	√		
1203	√	√	√	√			√							√	√	√		
1204	√	√	√	√		√		√						√	√	√		
1205	√	√	√	√	√			√						√	√	√		
1206	√	√	√	√	√		√							√	√	√		
1207	√	√	√	√		√	√							√	√	√		
1210 and 1211	√	√	√	√			√	√						√	√	√		
1212 and 1213	√	√	√	√	√	√								√	√	√		
1230	√	√	√	√	√			√				√		√	√	√		
1231	√	√	√	√		√		√				√		√	√	√		
1232	√	√	√	√		√	√					√		√	√	√		
1233	√	√	√	√		√		√				√		√	√	√		
1240 and 1241	√	√	√	√	√	√	√	√		√				√	√	√		
1250	√	√	√	√	√	√	√	√	√	√				√	√	√		
1251	√	√	√	√	√	√	√	√	√	√		√		√	√	√		
1252 to 1253	√	√	√	√	√	√	√	√	√	√				√	√	√		
1260 to 1269	√	√	√	√	√	√	√	√						√	√	√		
1270 and 1271			√		√	√	√	√	√					√	√	√		
1280 to 1283	√	√	√						√	√	√			√	√	√		
1285 to 1288	√	√	√						√	√				√	√	√		
1300	√	√	√	√	√									√	√	√		
1301	√	√	√	√		√								√	√	√		
1302	√	√	√	√			√							√	√	√		
1303	√	√	√	√				√						√	√	√		
1304	√	√	√	√	√		√							√	√	√		
1305	√	√	√	√		√	√							√	√	√		
1306	√	√	√	√		√		√						√	√	√		
1307	√	√	√	√	√			√						√	√	√		
1330 to 1332	√	√	√	√										√	√	√		
1340	√	√	√	√	√									√	√	√		
1341	√	√	√	√		√								√	√	√		
1343	√	√	√	√				√						√	√	√		
1344	√	√	√	√			√							√	√	√		
1347	√	√	√	√		√	√							√	√	√		
1349	√	√	√	√	√			√						√	√	√		
1350 and 1351	√	√	√	√										√	√	√		
1360	√	√	√	√	√	√								√	√	√		
1361	√	√	√	√			√	√						√	√	√		
1362	√	√	√	√	√	√								√	√	√		
1363	√	√	√	√			√	√						√	√	√		
1370 and 1371	√	√	√	√	√	√								√	√	√		
1372 and 1373	√	√	√	√			√	√						√	√	√		
1380 to 1388	√	√	√	√	√	√	√	√						√	√	√		
1390	√	√	√	√	√	√		√						√	√	√		
1391	√	√	√	√	√			√						√	√	√		

Effect Pattern Variant Forms and Decorations

Pattern No.	TITLE	EDGE			CROP				LOCATE		LIGHTING			TRAIL			OPTION	
		BD	SF	BV	L	R	T	B	XY	Z	SP	LN	PL	TR	DB	DS	711	712
1392	√	√	√	√		√		√						√	√	√		
1393	√	√	√	√	√		√							√	√	√		
1394	√	√	√	√		√	√							√	√	√		
1500	√	√	√	√	√	√	√	√						√	√	√		
1501	√	√	√	√	√		√	√						√	√	√		
1502	√	√	√	√		√	√	√						√	√	√		
1503	√	√	√	√	√	√		√						√	√	√		
1504	√	√	√	√	√	√	√							√	√	√		
1505	√	√	√	√	√		√							√	√	√		
1506	√	√	√	√		√	√							√	√	√		
1507	√	√	√	√		√		√						√	√	√		
1508	√	√	√	√	√			√						√	√	√		
1510	√	√	√	√	√									√	√	√		
1511	√	√	√	√		√								√	√	√		
1512	√	√	√	√			√											
1513	√	√	√	√				√										
1514	√	√	√	√	√	√								√	√	√		
1515	√	√	√	√			√	√						√	√	√		
1520 to 1522	√	√	√	√										√	√	√		
1523	√	√	√	√	√	√								√	√	√		
1524	√	√	√	√			√	√						√	√	√		
1530 to 1535	√	√	√	√										√	√	√		
1600	√	√	√	√		√	√							√	√	√		
1601	√	√	√	√	√			√						√	√	√		
1602	√	√	√	√		√		√						√	√	√		
1603	√	√	√	√	√		√							√	√	√		
1604	√	√	√	√	√			√						√	√	√		
1605	√	√	√	√		√	√							√	√	√		
1606	√	√	√	√	√		√							√	√	√		
1607	√	√	√	√		√		√						√	√	√		
1610	√	√	√	√		√	√	√						√	√	√		
1611 and 1612	√	√	√	√	√		√	√						√	√	√		
1613	√	√	√	√		√	√	√						√	√	√		
1620 to 1644	√	√	√	√	√	√	√	√						√	√	√		
1690	√	√	√	√	√	√	√	√	√					√	√	√		
1700	√	√	√	√	√		√	√			√	√	√	√	√	√		
1701	√	√	√	√		√	√	√			√	√	√	√	√	√		
1702	√	√	√	√	√	√	√				√	√	√	√	√	√		
1703	√	√	√	√	√	√		√			√	√	√	√	√	√		
1704	√	√	√	√	√						√	√	√	√	√	√		
1705	√	√	√	√		√					√	√	√	√	√	√		
1706	√	√	√	√			√				√	√	√	√	√	√		
1707	√	√	√	√				√			√	√	√	√	√	√		
1730	√	√	√	√			√	√			√	√	√	√	√	√		
1731	√	√	√	√							√	√	√	√	√	√		

Pattern No.	TITLE	EDGE			CROP				LOCATE		LIGHTING			TRAIL			OPTION	
		BD	SF	BV	L	R	T	B	XY	Z	SP	LN	PL	TR	DB	DS	711	712
1732	√	√	√	√	√	√	√	√			√	√	√	√	√	√		
1740	√	√	√	√	√	√					√	√	√	√	√	√		
1741	√	√	√	√							√	√	√	√	√	√		
1742	√	√	√	√	√	√	√	√			√	√	√	√	√	√		
1750 to 1753	√	√	√	√	√	√	√	√			√	√		√	√	√		
1760 to 1770	√	√	√	√	√	√	√	√			√	√	√	√	√	√		
1780 to 1783	√	√	√	√	√	√	√	√			√		√	√	√	√		
1800 to 1806	√	√	√	√	√	√	√	√			√	√	√	√	√	√		
1807 to 1811	√	√	√	√	√	√	√	√			√		√	√	√	√		
1812 to 1816	√	√	√	√	√	√	√	√			√	√	√	√	√	√		
1820	√	√	√	√				√						√	√	√		
1821	√	√	√	√	√									√	√	√		
1822	√	√	√	√		√								√	√	√		
1823	√	√	√	√		√		√						√	√	√		
1824	√	√	√	√	√			√						√	√	√		
1850		√	√		√	√					√	√	√					
1851		√	√				√	√			√	√	√					
1852		√	√		√	√					√	√	√					
1853		√	√				√	√			√	√	√					
1854		√	√		√	√					√	√	√					
1855		√	√				√	√			√	√	√					
1900		√	√	√	√	√								√	√	√		
1901		√	√	√			√	√						√	√	√		
1902 to 1945		√	√	√	√	√	√	√			√	√	√	√	√	√		
1946		√	√	√	√	√	√	√			√		√	√	√	√		
1947		√	√	√	√	√	√	√						√	√	√		
1948		√	√	√	√	√	√	√			√		√	√	√	√		
1949 and 1950		√	√	√	√	√	√	√			√	√	√	√	√	√		
1951		√	√	√	√	√								√	√	√		
1952		√	√	√			√	√						√	√	√		
1954		√	√	√	√	√								√	√	√		
1955		√	√	√	√	√	√	√			√	√	√	√	√	√		
1956		√	√	√	√	√								√	√	√		
1958 and 1959		√	√	√	√	√	√	√						√	√	√		
1960 to 1964		√	√	√	√	√	√	√			√	√	√	√	√	√		
2000 to 2003	√	√	√	√	√	√	√	√			√	√		√	√	√		
2100	√	√	√	√	√			√				√		√	√	√		
2101	√	√	√	√		√		√				√		√	√	√		
2102	√	√	√	√	√			√				√		√	√	√		
2103	√	√	√	√		√		√				√		√	√	√		
2104	√	√	√	√	√		√					√		√	√	√		
2105	√	√	√	√	√			√				√		√	√	√		
2106	√	√	√	√		√		√				√		√	√	√		
2107	√	√	√	√		√	√					√		√	√	√		
2108	√	√	√	√	√			√				√		√	√	√		

Effect Pattern Variant Forms and Decorations

Pattern No.	TITLE	EDGE			CROP				LOCATE		LIGHTING			TRAIL			OPTION	
		BD	SF	BV	L	R	T	B	XY	Z	SP	LN	PL	TR	DB	DS	711	712
2109	√	√	√	√	√		√					√		√	√	√		
2110	√	√	√	√	√			√				√		√	√	√		
2111	√	√	√	√	√		√	√				√		√	√	√		
2112	√	√	√	√	√		√					√		√	√	√		
2113	√	√	√	√		√		√				√		√	√	√		
2114	√	√	√	√	√	√		√				√		√	√	√		
2115 to 2120	√	√	√	√	√		√	√				√		√	√	√		
2121 to 2125	√	√	√	√	√	√	√	√				√		√	√	√		
2126	√	√	√	√	√			√				√		√	√	√		
2127 to 2144	√	√	√	√	√	√	√	√				√		√	√	√		
2150 to 2154	√	√	√	√	√	√	√	√				√		√	√	√		
2160	√	√	√	√		√	√					√		√	√	√		
2161 and 2162	√	√	√	√	√			√				√		√	√	√		
2163	√	√	√	√		√		√				√		√	√	√		
2164	√	√	√	√			√					√		√	√	√		
2165	√	√	√	√				√				√		√	√	√		
2166	√	√	√	√	√							√		√	√	√		
2167	√	√	√	√		√						√		√	√	√		
2200 to 2213	√	√	√	√	√	√	√	√			√			√	√	√		
2250 and 2251	√	√	√	√	√	√	√	√	√	√	√			√	√	√		
2260	√	√	√	√	√	√	√	√	√	√		√		√	√	√		
2261		√	√	√	√	√	√	√	√	√		√		√	√	√		
2262 and 2263	√	√	√	√	√	√	√	√	√	√		√		√	√	√		
2264		√	√	√	√	√	√	√	√	√		√		√	√	√		
2265 and 2266	√	√	√	√	√	√	√	√	√	√		√		√	√	√		
2267		√	√	√	√	√	√	√	√	√		√		√	√	√		
2268	√	√	√	√	√	√	√	√	√	√		√		√	√	√		
2269		√	√	√	√	√	√	√	√	√		√		√	√	√		
2270 to 2273	√	√	√	√	√	√	√	√	√	√				√	√	√		
2274	√	√	√	√	√	√	√	√						√	√	√		
2275 to 2278	√	√	√	√	√	√	√	√	√	√				√	√	√		
2279		√	√	√	√	√	√	√	√	√				√	√	√		
2280 and 2281	√	√	√	√	√	√	√	√	√	√		√		√	√	√		
2282	√	√	√	√	√	√	√	√			√	√		√	√	√		
2283	√	√	√	√	√	√	√	√				√		√	√	√		
2284									√	√		√						
2300		√	√	√	√	√								√	√	√	☆	
2301		√	√	√			√	√						√	√	√	☆	
2302		√	√	√	√	√								√	√	√	☆	
2303		√	√	√			√	√						√	√	√	☆	
2304 to 2307		√	√	√	√	√	√	√						√	√	√	☆	
2320		√	√	√	√	√								√	√	√	☆	
2321		√	√	√			√	√						√	√	√	☆	
2322 and 2323		√	√	√	√	√	√	√						√	√	√	☆	
2324		√	√	√	√	√		√						√	√	√	☆	

Pattern No.	TITLE	EDGE			CROP				LOCATE		LIGHTING			TRAIL			OPTION	
		BD	SF	BV	L	R	T	B	XY	Z	SP	LN	PL	TR	DB	DS	711	712
2325		√	√	√	√	√	√							√	√	√	☆	
2326		√	√	√	√	√		√						√	√	√	☆	
2327		√	√	√	√	√	√							√	√	√	☆	
2328 and 2329		√	√	√	√	√	√	√						√	√	√	☆	
2340 to 2344		√	√	√	√	√	√	√						√	√	√	☆	
2345 and 2346		√	√	√	√	√	√	√			√	√	√	√	√	√	☆	
2347 and 2348		√	√	√	√	√	√	√						√	√	√	☆	
2349 and 2350		√	√	√	√	√	√	√			√	√	√	√	√	√	☆	
2351		√	√	√	√	√	√	√			√		√	√	√	√	☆	
2352 and 2353		√	√	√	√	√	√	√			√	√	√	√	√	√	☆	
2354 and 2355		√	√	√	√	√	√	√			√		√	√	√	√	☆	
2356 and 2357		√	√	√	√	√	√	√			√	√	√	√	√	√	☆	
2360 to 2375		√	√	√	√	√	√	√			√	√	√	√	√	√	☆	
2380 to 2395		√	√	√	√	√	√	√			√	√	√	√	√	√	☆	
2400 to 2419		√	√	√	√	√	√	√			√	√	√	√	√	√	☆	
2420 to 2427		√	√	√	√	√	√	√			√	√	√	√	√	√	☆	
2428 and 2429		√	√	√	√	√	√	√			√		√	√	√	√	☆	
2430 to 2437		√	√	√	√	√	√	√			√	√	√	√	√	√	☆	
2470 to 2473		√	√	√	√	√	√	√			√	√	√	√	√	√	☆	
2480 to 2483		√		√	√	√	√	√			√		√	√	√	√	☆	
2484 to 2499		√		√	√	√	√	√			√	√	√	√	√	√	☆	
2500	√	√	√	√	√	√	√	√								√	☆	
2501 to 2517	√	√	√	√	√	√	√	√						√	√	√	☆	
2518 to 2519	√	√	√	√	√	√	√	√	√	√				√	√	√	☆	
2520	√	√	√	√	√	√	√	√								√	☆	
2521 to 2523	√	√	√	√	√	√	√	√						√	√	√	☆	
2524 and 2525	√	√	√	√										√	√	√	☆	
2526 and 2527	√	√	√	√	√	√	√	√						√	√	√	☆	
2530 and 2531	√	√	√	√	√	√	√	√			√	√	√	√	√	√	☆	
2532	√	√	√	√	√	√	√	√						√	√	√	☆	
2533 and 2534	√	√	√	√	√	√	√	√			√	√	√	√	√	√	☆	
2550 to 2554	√	√	√	√	√	√	√	√				√		√	√	√	☆	
2560 to 2564	√	√	√	√	√	√	√	√				√		√	√	√	☆	
2600 to 2620		√	√	√	√	√	√	√			√			√	√	√		★
2624		√	√	√	√	√	√	√	√		√			√	√	√		★
2625					√	√					√			√	√	√		★
2630 to 2633		√	√	√	√	√	√	√	√	√	√			√	√	√		★
2640 to 2651		√	√	√	√	√	√	√			√			√	√	√		★
2660 and 2661		√	√	√	√	√	√	√			√			√	√	√	☆	★
2690											√			√	√	√		★
2691 and 2692		√	√	√	√	√	√	√	√		√			√	√	√		★
2700 to 2715		√	√	√	√	√	√	√	√	√	√			√	√	√		★
2720 to 2724		√	√	√	√	√	√	√	√	√	√			√	√	√		★
2730 to 2739		√	√	√	√	√	√	√	√	√	√			√	√	√		★
2740 to 2752		√	√	√	√	√	√	√			√			√	√	√		★

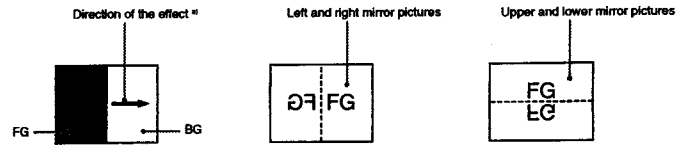
Effect Pattern Variant Forms and Decorations

Pattern No.	TITLE	EDGE			CROP				LOCATE		LIGHTING			TRAIL			OPTION	
		BD	SF	BV	L	R	T	B	XY	Z	SP	LN	PL	TR	DB	DS	711	712
2800 to 2805		√	√	√	√	√	√	√	√	√	√			√	√	√		★
2810 to 2813		√	√	√	√	√	√	√	√	√	√			√	√	√		★
2820 to 2827		√	√	√	√	√	√	√	√	√	√			√	√	√		★
2830 to 2833		√	√	√	√	√	√	√	√	√	√			√	√	√	☆	★
2840 to 2845		√	√	√	√	√	√	√	√	√	√			√	√	√		★
2850 to 2857		√	√	√	√	√	√	√	√	√	√			√	√	√		★
2860 and 2861																		★
2865		√	√	√	√	√	√	√	√	√	√			√	√	√		★
2866									√	√	√			√	√	√		★
2870 to 2876									√	√	√			√	√	√		★
2880 and 2881											√			√	√	√		★
9000 to 9009	√	√	√	√	√	√	√	√	√	√				√	√	√		
9100 to 9109	√	√	√	√	√	√	√	√	√	√				√	√	√		
9200 to 9209	√	√	√	√	√	√	√	√	√	√		√		√	√	√		
9300 to 9309	√	√	√	√	√	√	√	√	√	√		√		√	√	√		

Effect Pattern Image List

This section illustrates the effect patterns of the DFS-700/700P.

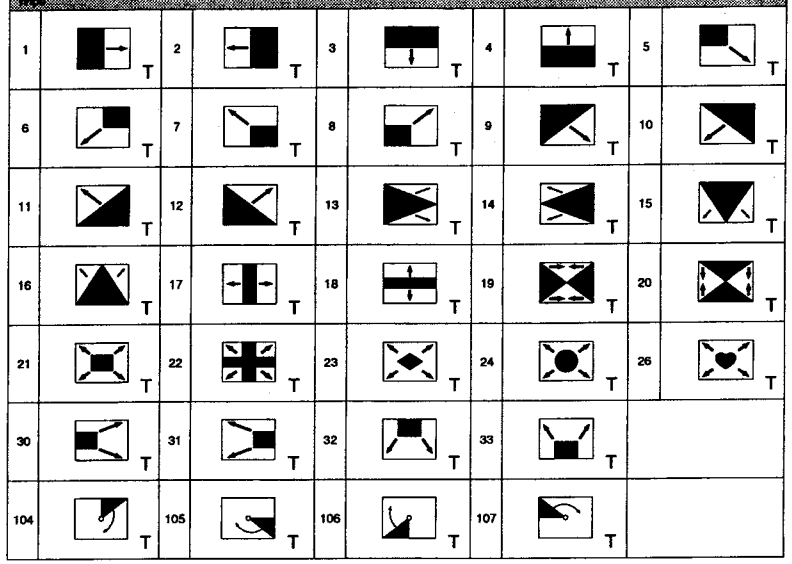
How to read the patterns



a) Direction of the effect when executed in normal direction

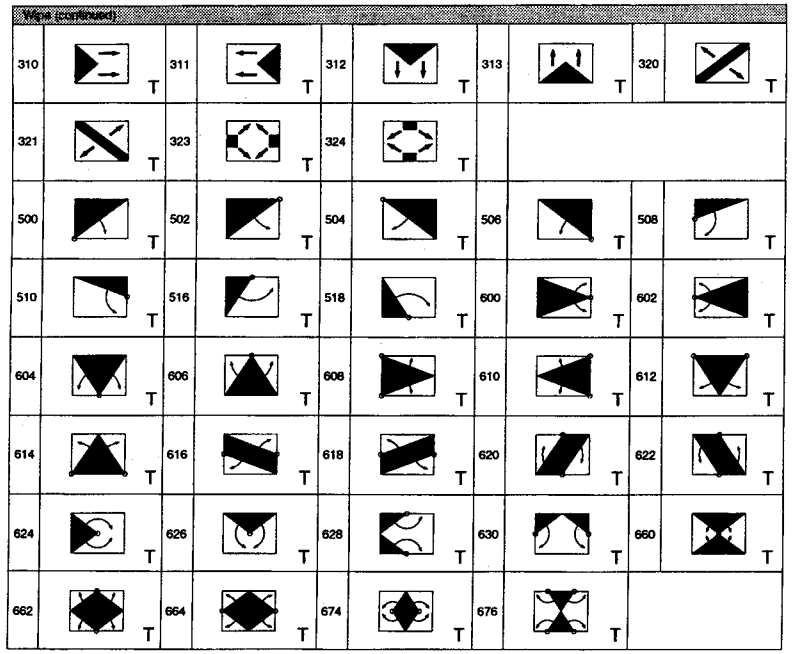
Abbreviations in the illustrated patterns
FG: Foreground picture
BG: Background picture
T: Transition type
A: Animation type

No.

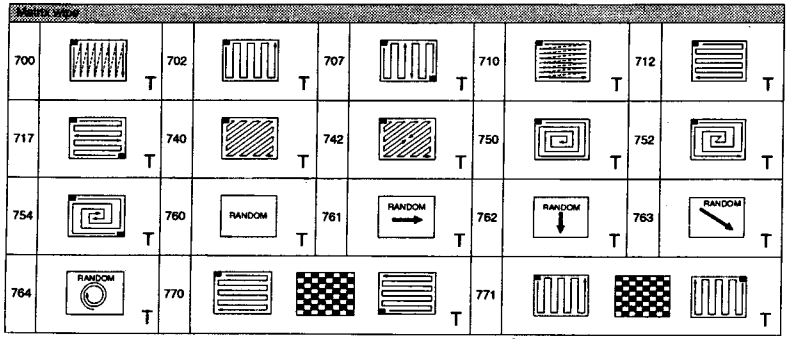


Effect Pattern Image List

Wipe (continued)

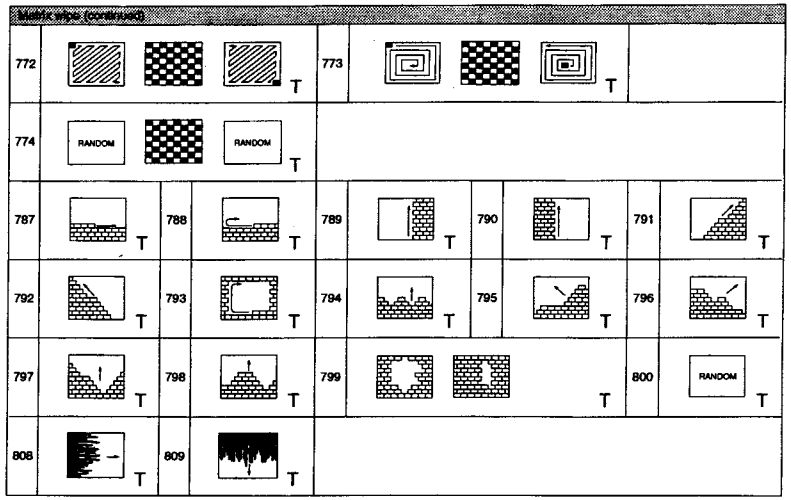


Matrix wipe

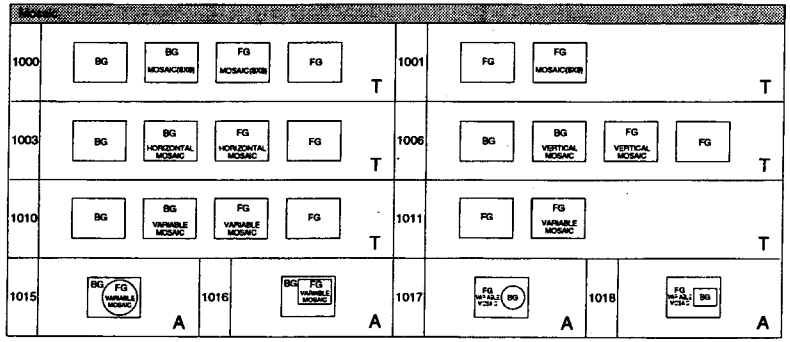


(continued)

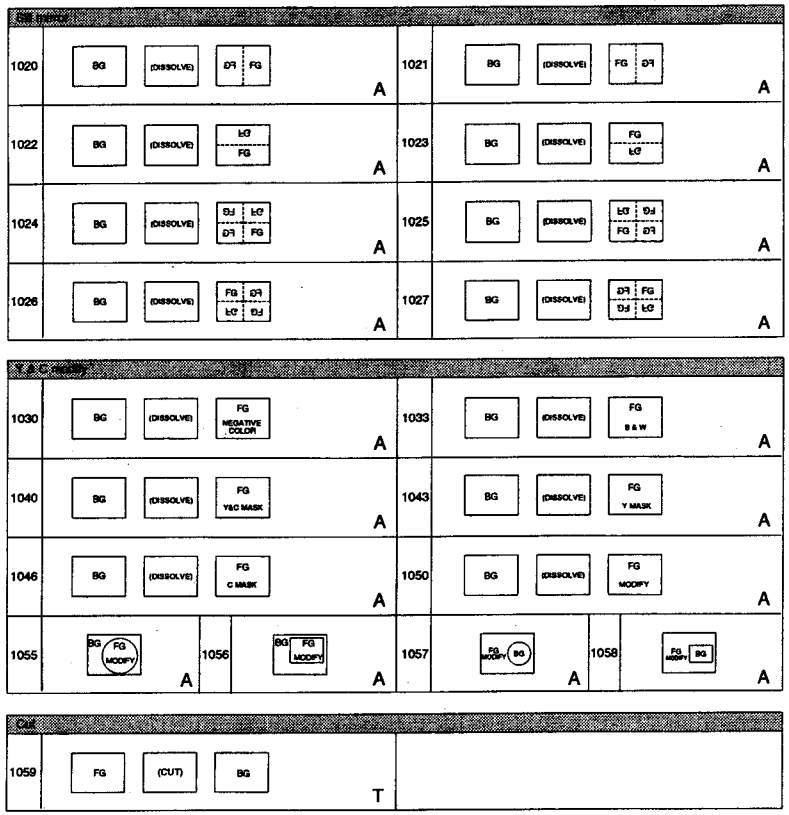
Matrix wipe (continued)

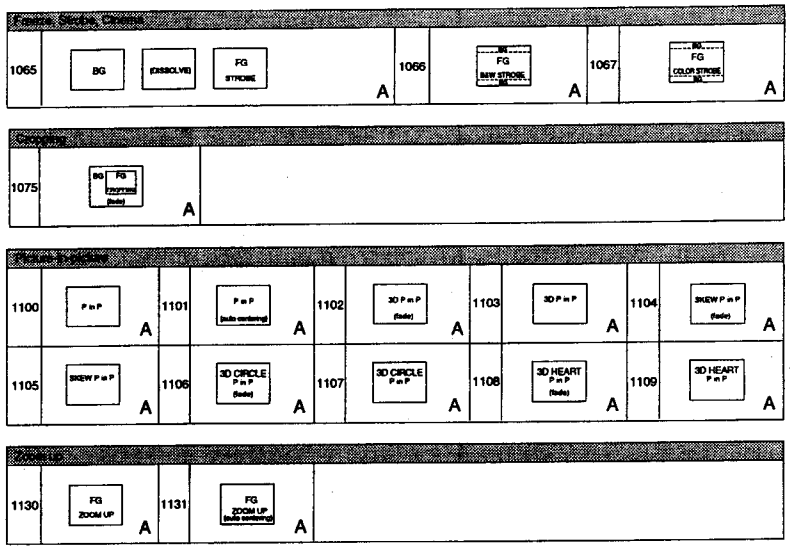


Mosaic

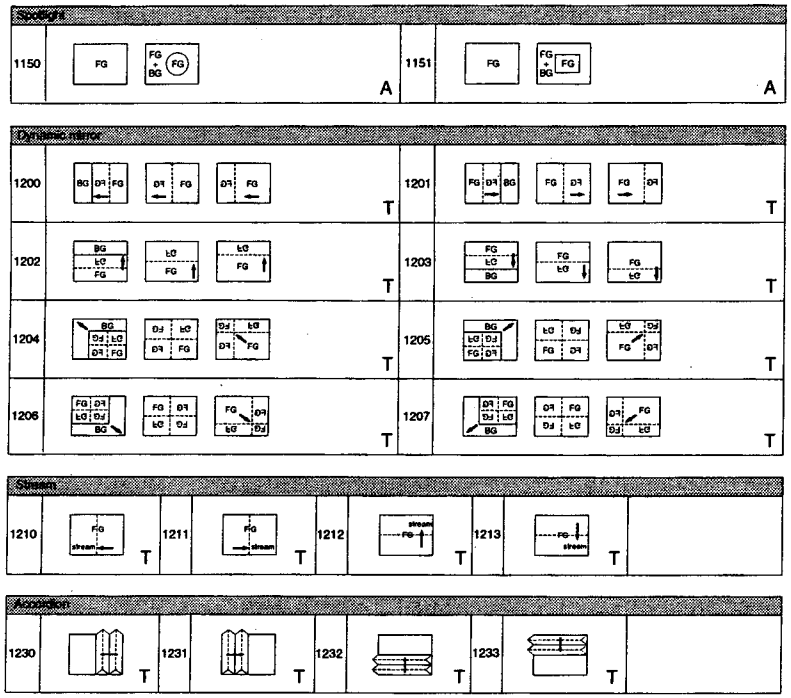


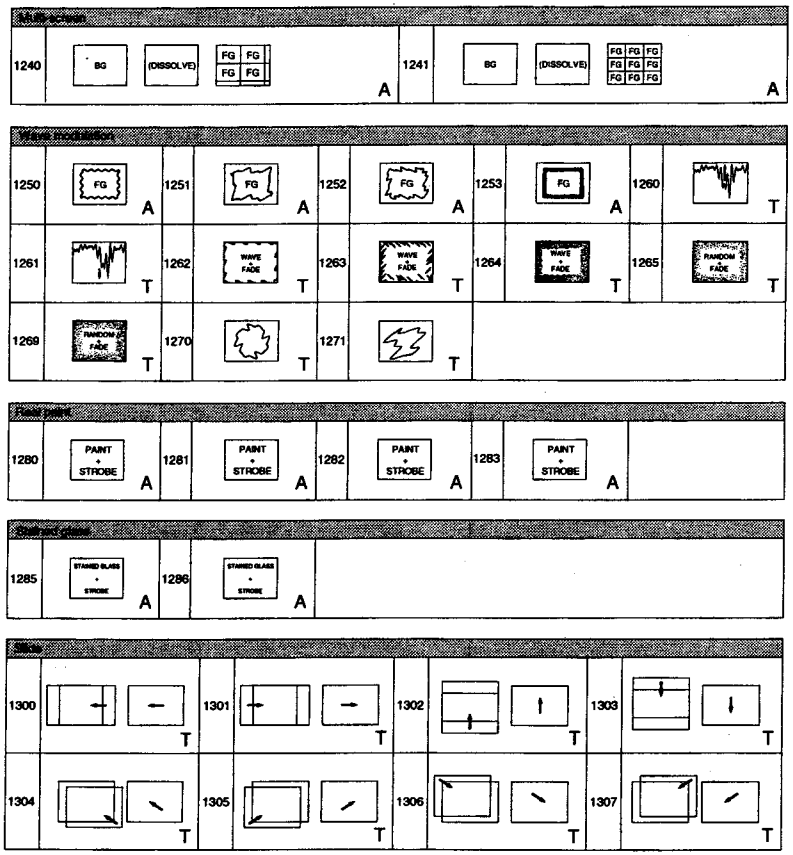
Effect Pattern Image List


Cut Border
1020 BG (DISSOLVE) FG A
1021 BG (DISSOLVE) FG A
1022 BG (DISSOLVE) FG A
1023 BG (DISSOLVE) FG A
1024 BG (DISSOLVE) FG A
1025 BG (DISSOLVE) FG A
1026 BG (DISSOLVE) FG A
1027 BG (DISSOLVE) FG A
A/C Border
1030 BG (DISSOLVE) FG NEGATIVE COLOR A
1033 BG (DISSOLVE) FG B & W A
1040 BG (DISSOLVE) FG Y&C MASK A
1043 BG (DISSOLVE) FG Y MASK A
1046 BG (DISSOLVE) FG C MASK A
1050 BG (DISSOLVE) FG MODIFY A
1055 BG FG MODIFY A
1056 BG FG MODIFY A
1057 FG MODIFY BG A
1058 FG MODIFY BG A
Cut
1059 FG (CUT) BG T


Fusion, Strobe, Chroma
1065 BG (DISSOLVE) FG STROBE A
1066 BG FG B&W STROBE A
1067 BG FG COLOR STROBE A
Freeze
1075 BG FG A
Picture in Picture
1100 P in P A
1101 P in P A
1102 3D P in P A
1103 3D P in P A
1104 SKEW P in P A
1105 SKEW P in P A
1106 3D CIRCLE P in P A
1107 3D CIRCLE P in P A
1108 3D HEART P in P A
1109 3D HEART P in P A
Zoom
1130 FG ZOOM UP A
1131 FG ZOOM UP A

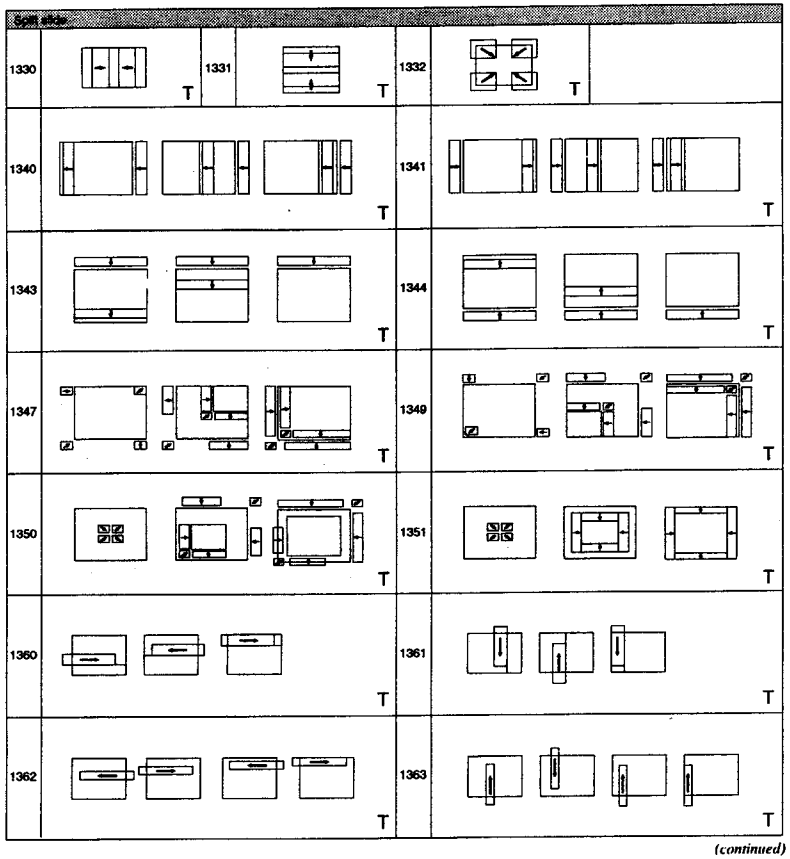
Effect Pattern Image List





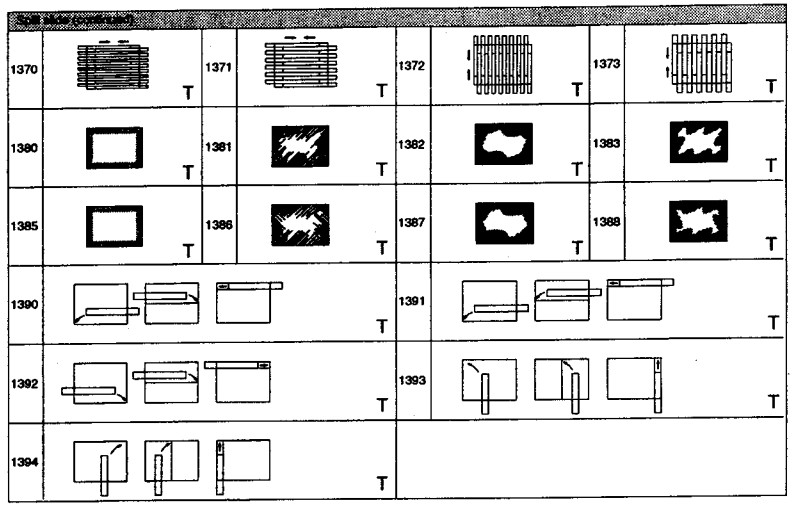
Effect Pattern Image List

Split slide



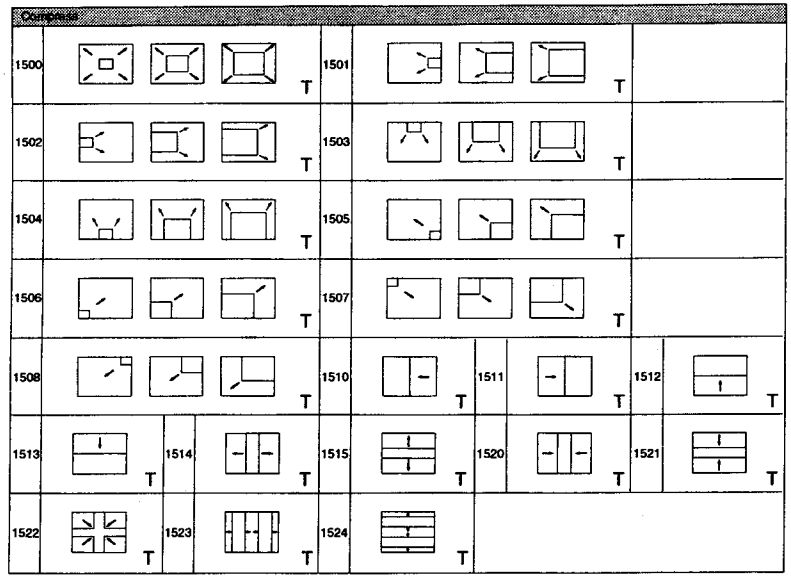
(continued)

Split slide (continued)

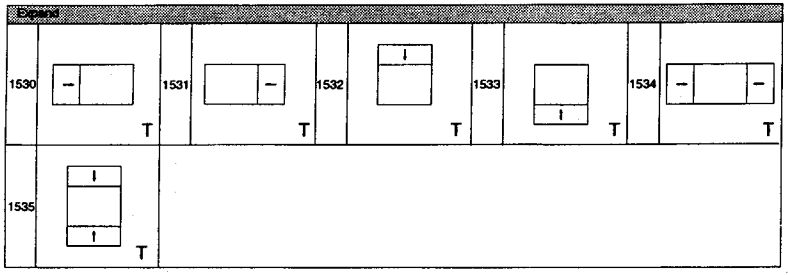


Effect Pattern Image List

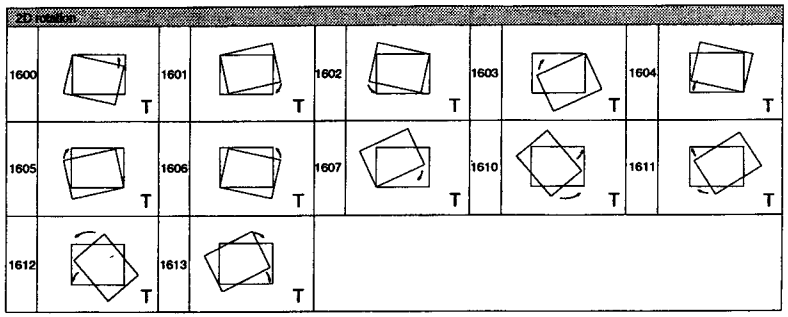
Compand



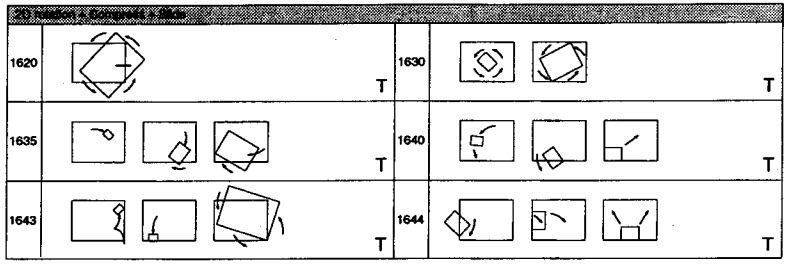
Expand



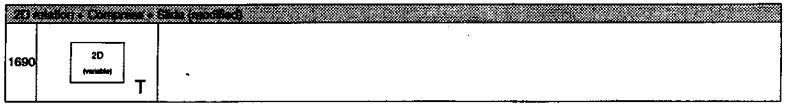
2D rotation



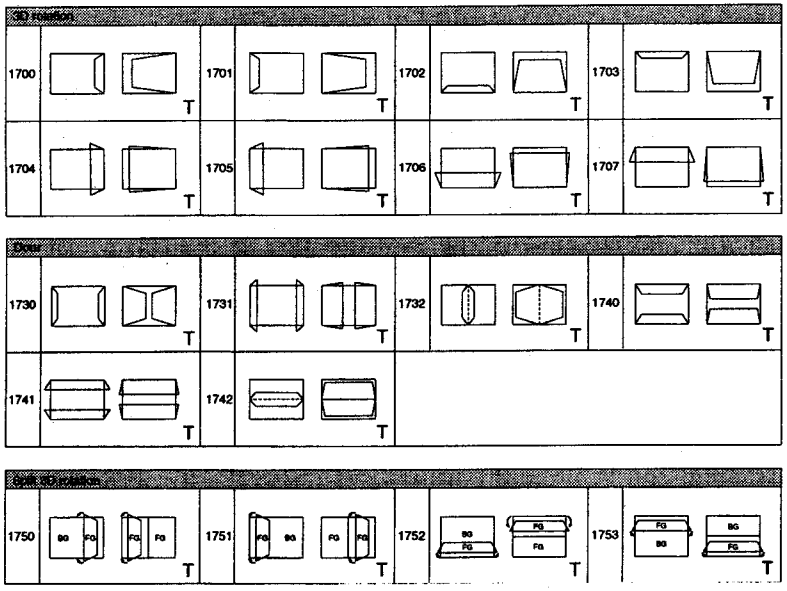
2D rotation + Compand + Shift

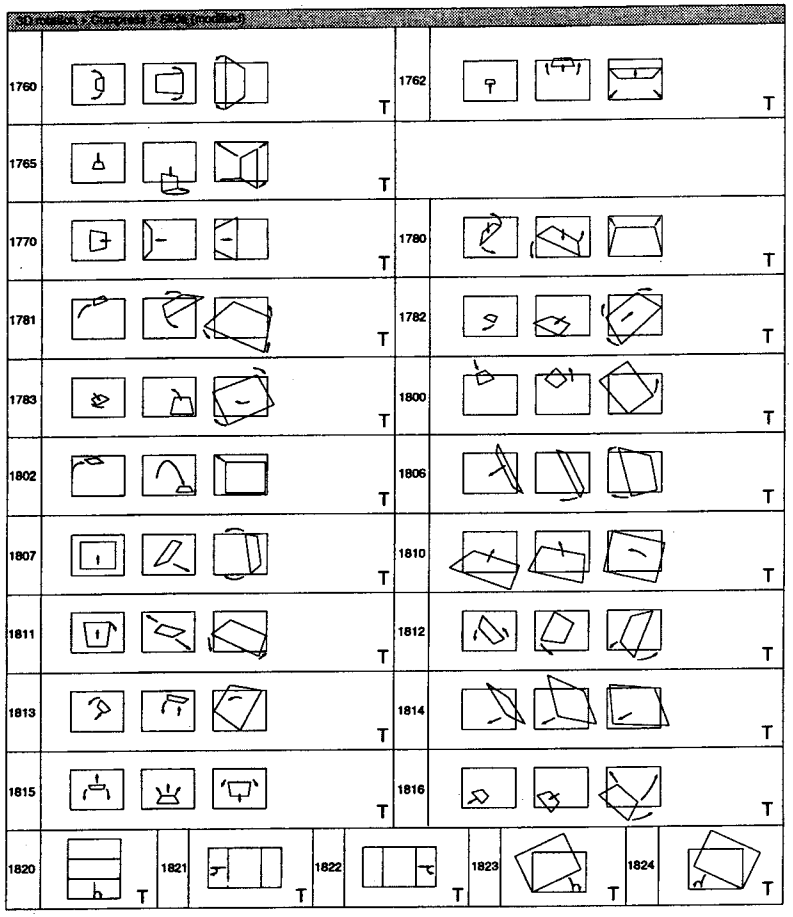


2D rotation + Compand + Shift (modified)



Effect Pattern Image List





Effect Pattern Image List

Album Turn

1850	T	1851	T
1852	T	1853	T
1854	T	1855	T

Flip Tumble

1900	T	1901	T
1902	T	1905	T
1906	T	1909	T
1912	T	1916	T
1920	T	1921	T
1930	T	1933	T
1940	T	1941	T

(continued)

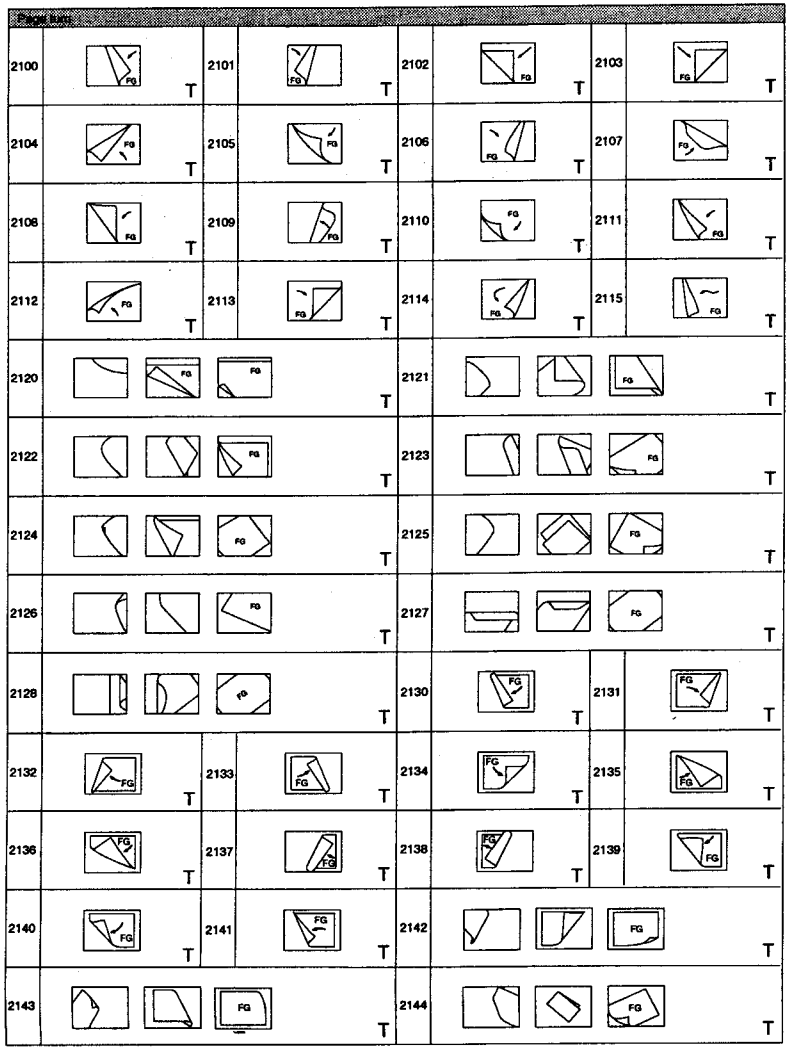
Flip Tumble (Continued)

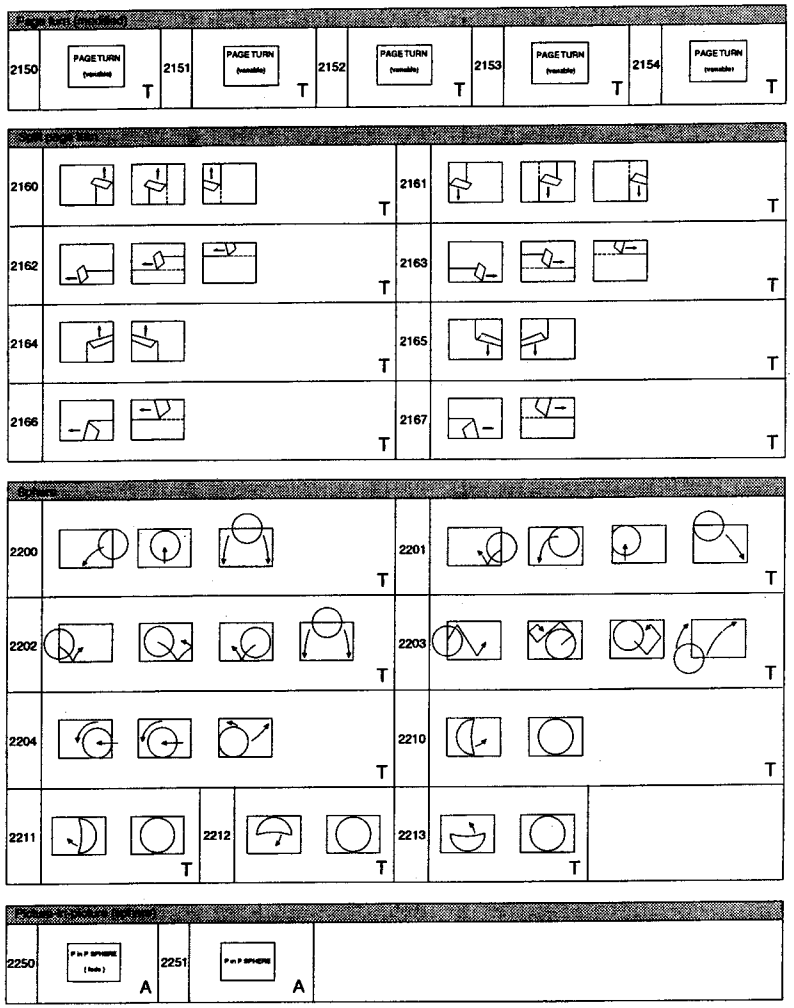
1942	T	1943	T
1944	T	1945	T
1946	T	1947	T
1948	T	1949	T
1950	T	1951	T
1952	T	1954	T
1955	T	1956	T
1958	T	1959	T
1960	T	1962	T
1964	T		

Twist

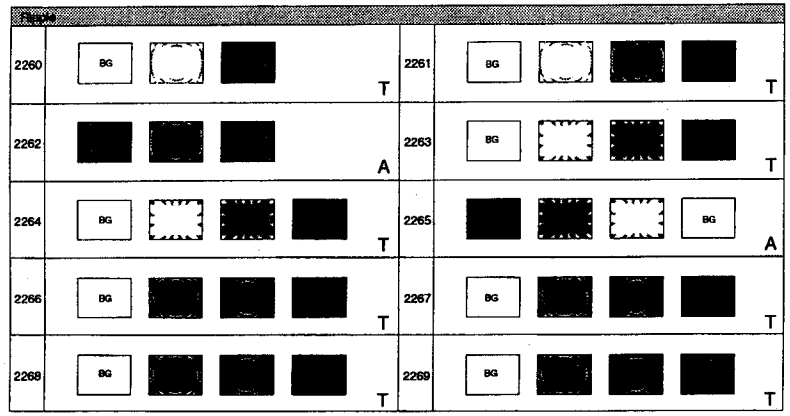
2000	T	2001	T
2002	T	2003	T

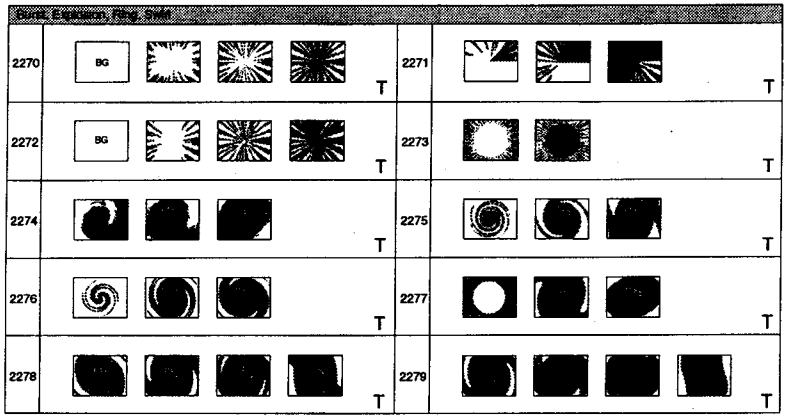
Effect Pattern Image List

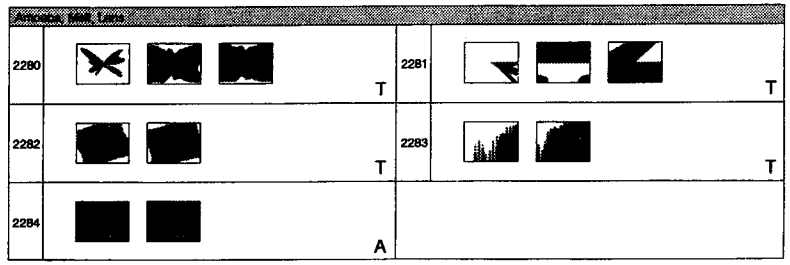


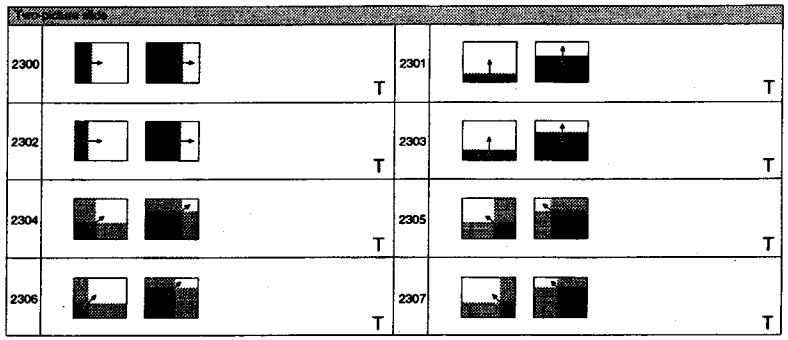


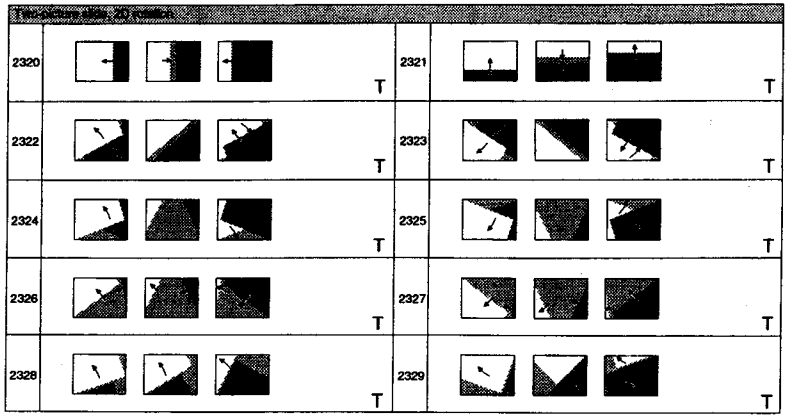
Effect Pattern Image List



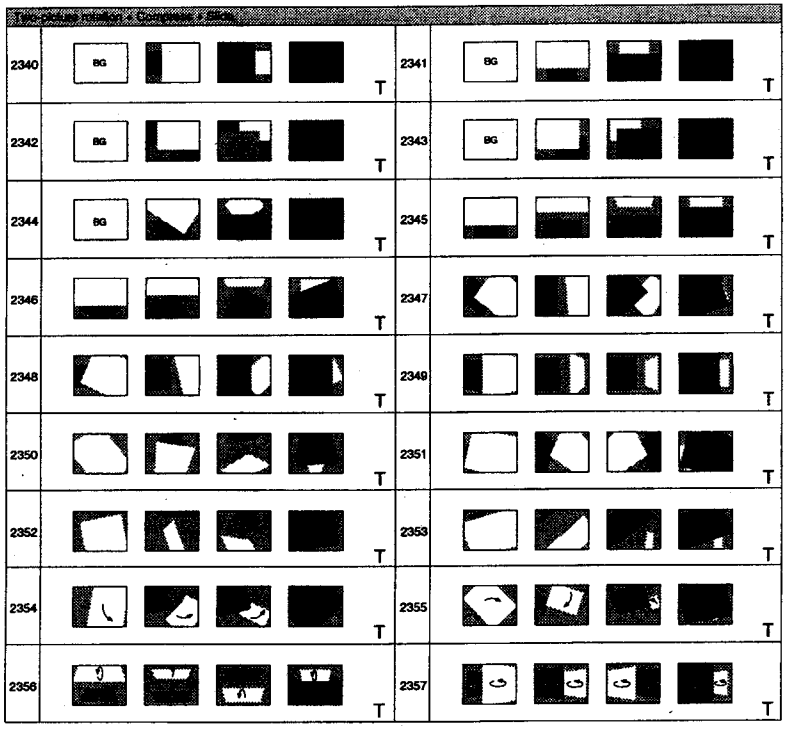


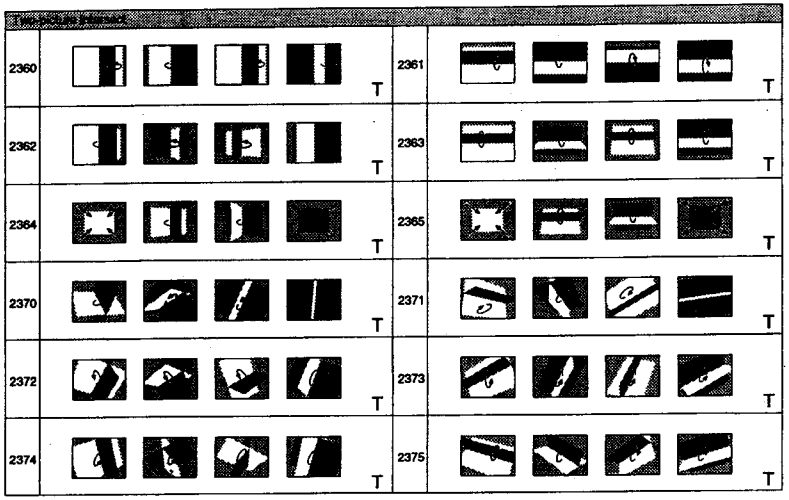






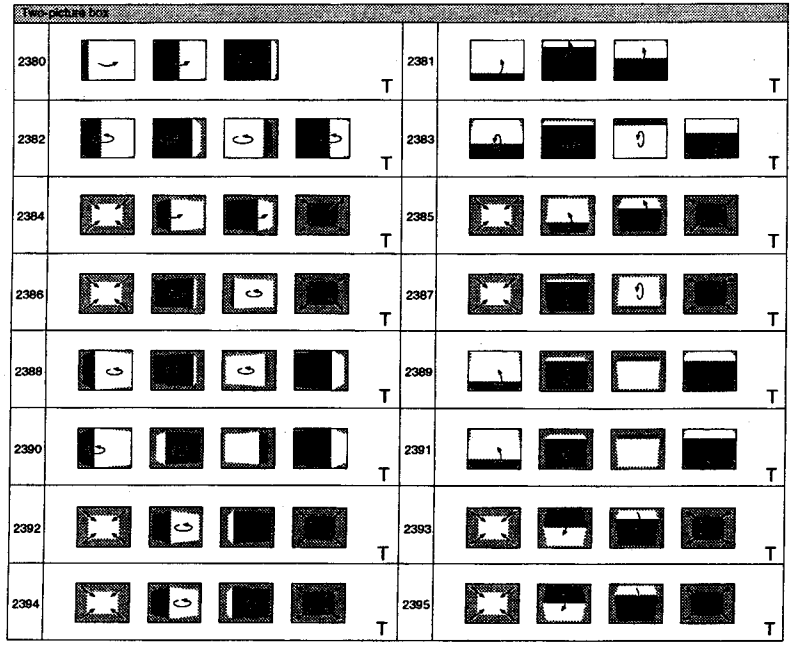
Effect Pattern Image List



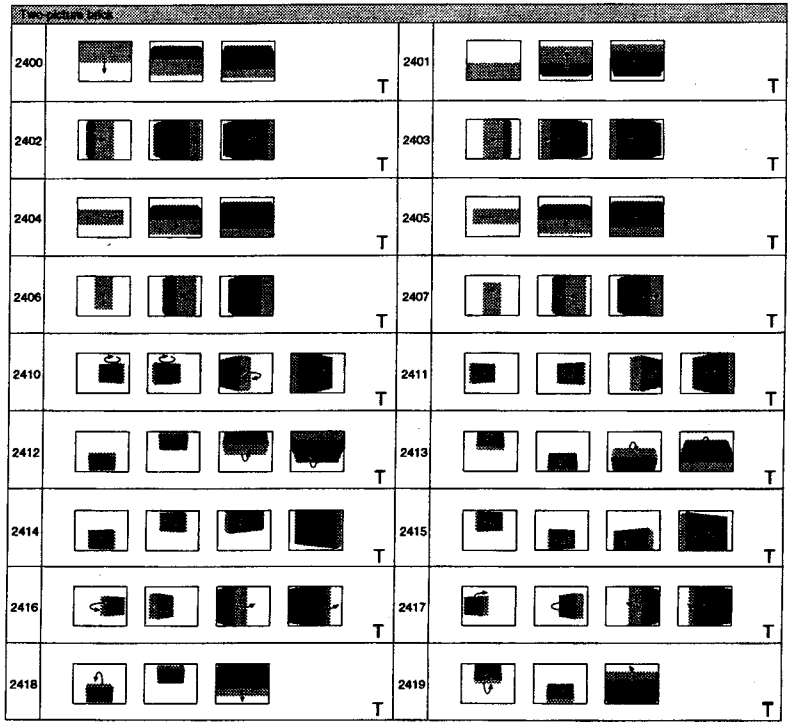


Effect Pattern Image List

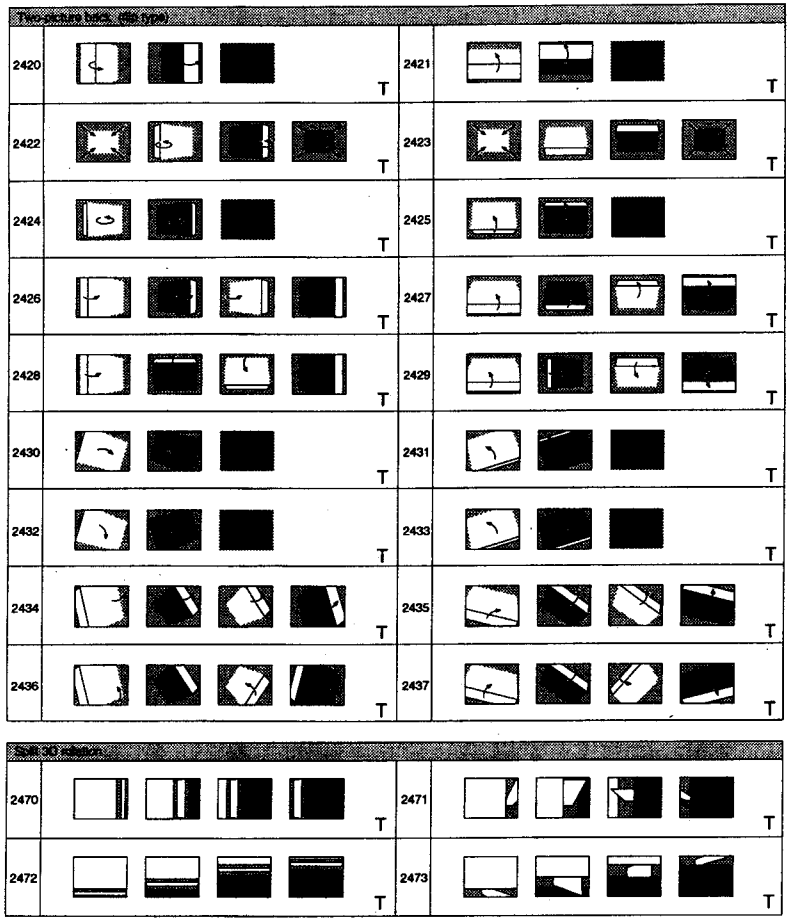
Two-picture box

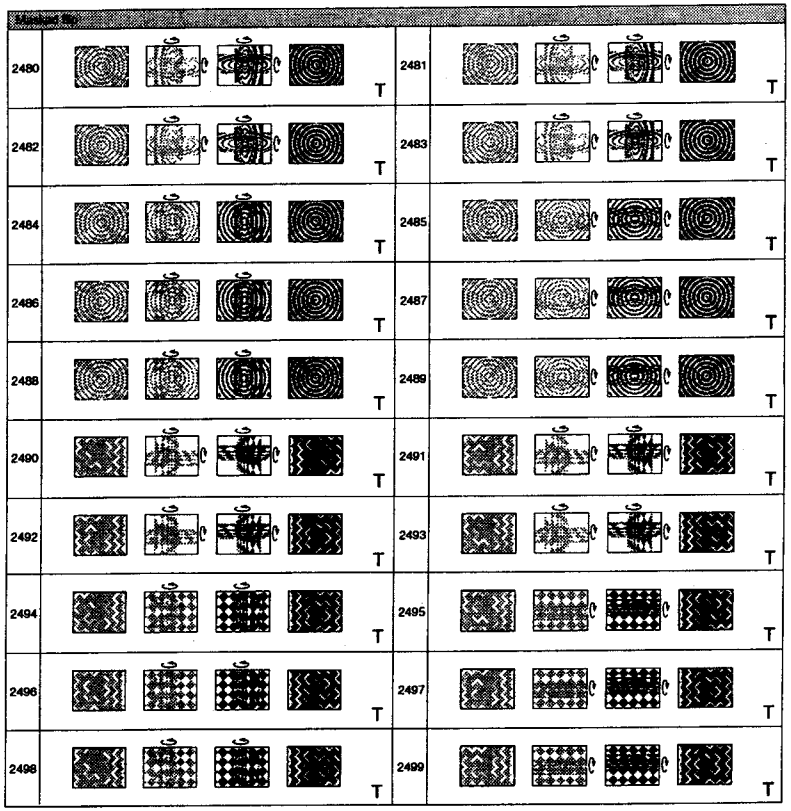


Two-picture brick



Effect Pattern Image List





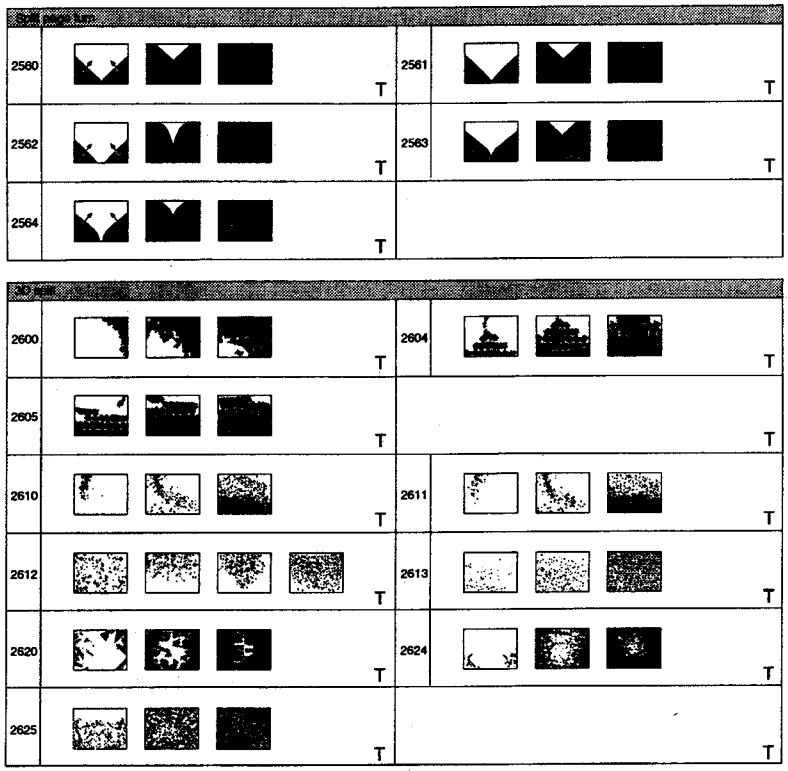
Effect Pattern Image List

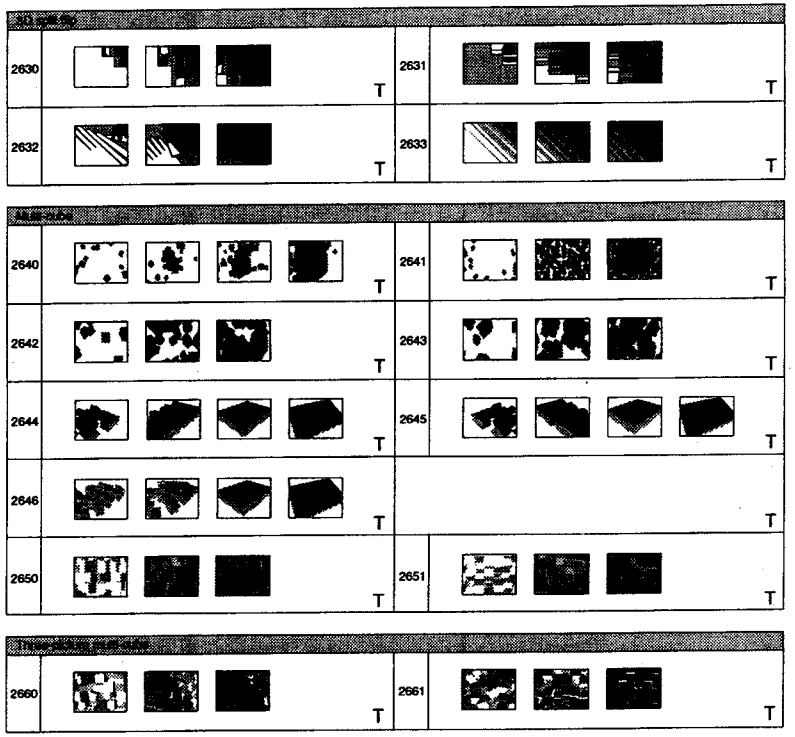
2500	A	2501	A
2502	A	2503	A
2504	A	2505	A
2506	A	2507	A
2508	A	2509	A
2510	A	2511	A
2512	A	2513	A
2514	A	2515	A
2516	A	2517	A
2518	A	2519	A

2520	BG A	2521	BG A
2522	BG A	2523	BG A
2524	BG A	2525	BG A
2526	A	2527	A
2530	A	2531	A
2532	A	2533	A
2534	A		

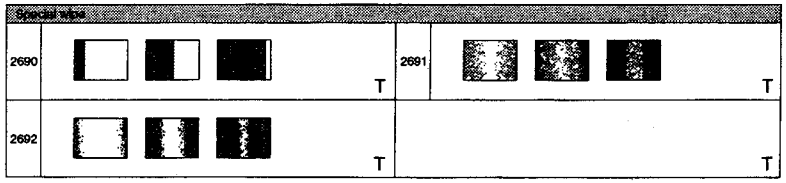
2550	T	2551	T
2552	T	2553	T
2554	T		

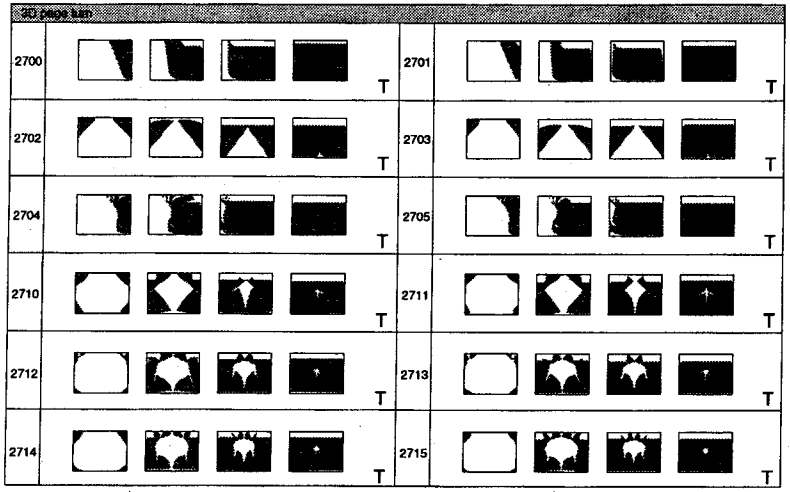
Effect Pattern Image List

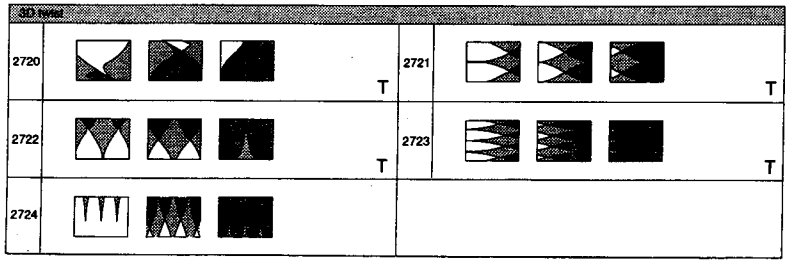


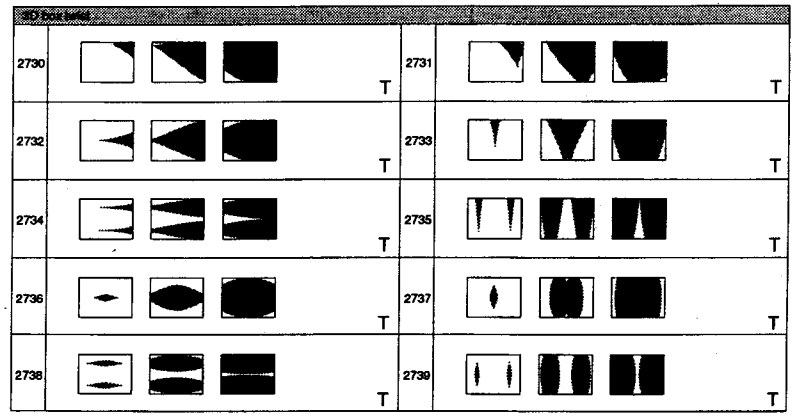


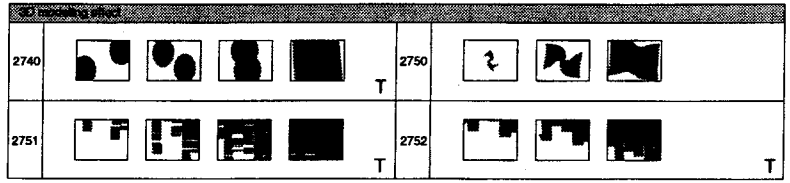
Effect Pattern Image List



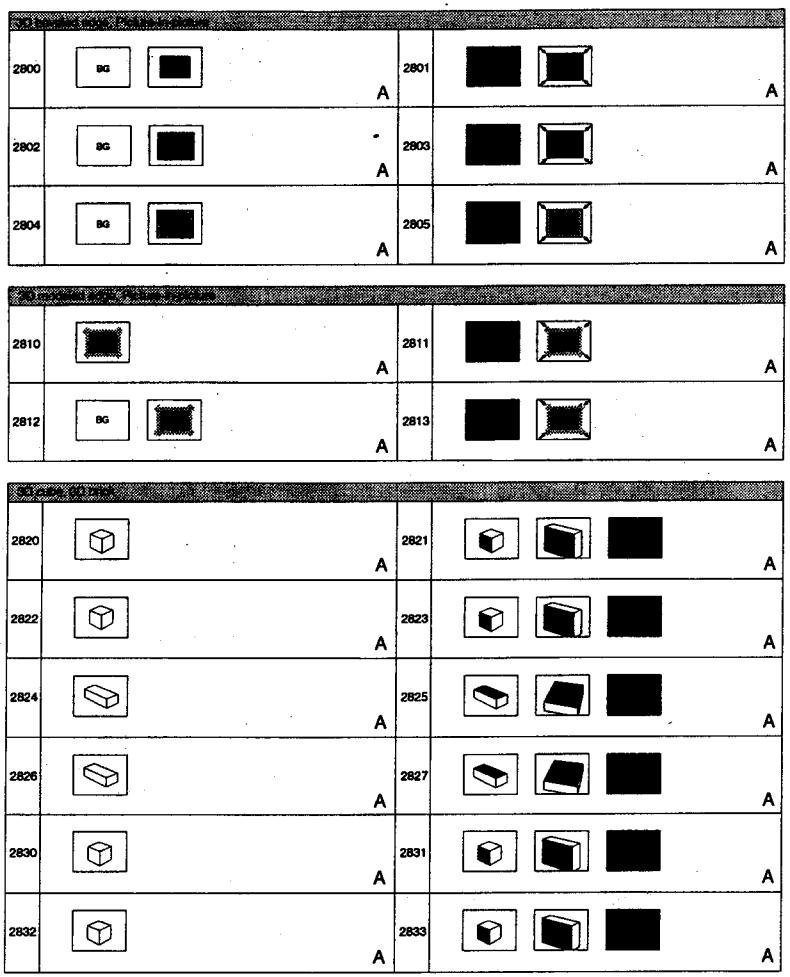


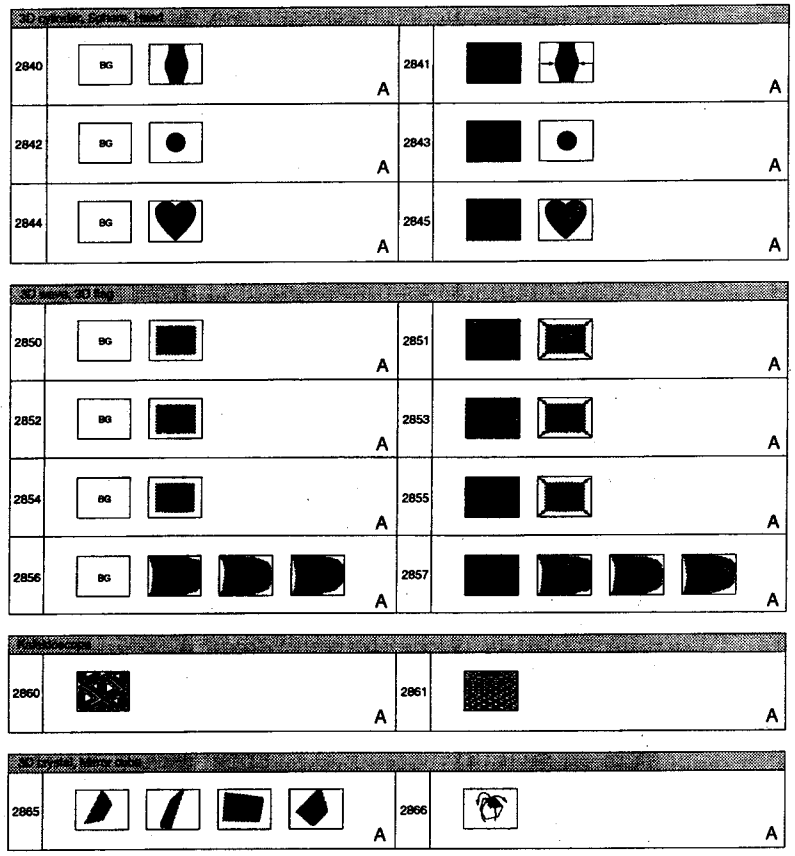






Effect Pattern Image List





Effect Pattern Image List

3D object effect							
2870			A	2871			A
2872			A	2873			A
2874			A	2875			A
2876			A	2880			A
2881			A				

To Exchange the Button Labels

After changing a pattern assignment, you can exchange the label on the numeric buttons.
Proceed as follows.

1 Write the new pattern on one of the supplied exchange labels.

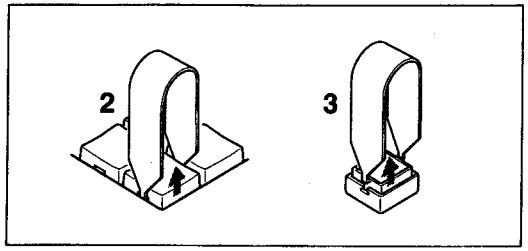
2 Insert the supplied tool into the hole at the side of the button and remove the button.

3 Insert the tool into the slot on the side of button. lifting up the white button cap, and remove the cap.

4 Remove the old label and insert the new label.

5 Replace the white button cap.

6 Return the button to its original position.



Specifications

General

Signaling system: DFS-700: NTSC; DFS-700P: PAL

Power requirements:
DFS-700: 100 V AC, 50/60 Hz
DFS-700P: 220/240 V AC, 50/60 Hz

Operating voltage: DFS-700: 90 to 130 V AC, 47 to 63 Hz; DFS-700P: 180 to 260 V AC, 47 to 63 Hz

Power consumption: 200 W

Peak inrush current:
(1) Power ON, current probe method: 24 A (240 V)
(2) Hot switching inrush current, measured in accordance with European standard EN55103-1:13 A (230 V)

Operating temperature: 0°C to 40°C (32°F to 104°F)

Dimensions: Control panel: 440 × 121 × 287 mm (w/h/d) (17 3/8 × 4 7/8 × 11 3/8 inches)
Processor: 440 × 133 × 520 mm (w/h/d) (17 3/8 × 5 1/4 × 20 1/2 inches)

Mass: Control panel: Approx. 3 kg (6 lb 9 oz)
Processor unit: Approx. 14 kg (30 lb 13 oz)

Signal processing

Sampling rate: Y: 13.5 MHz, R–Y/B–Y: 6.75 MHz, KEY: 13.5 MHz

Quantizing: Y/R–Y/B–Y: 8 bits, KEY: 8 bits

Linearity (composite output)
Differential gain: Less than 3.5% (composite input); Less than 2% (component, S-Video input)
Differential phase: Less than 2.5° (composite input); Less than 1.0° (component, S-Video input)

Frequency response: 0 to 5 MHz + 0.5 dB/–1 dB

S/N: More than 50 dB (composite); More than 55 dB (component, S-Video)

System delay: 1 frame
Preread mode: Background bus only 4H

Input signals

VIDEO INPUT
COMPONENT: BNC type (Y/R–Y/B–Y) × 4 (with BKDF-701: × 8); Y: 1.0 Vp-p, 75 ohms; R–Y/B–Y: 0.756 Vp-p, 75 ohms
RGB: To use some of the above COMPONENT connectors. R/G/B: 0.756 Vp-p, 75 ohms, sync on green
COMPOSITE (with BKDF-702/702P): BNC type × 4; VIDEO: 1.0 Vp-p, 75 ohms, sync negative
S-VIDEO (with BKDF-702/702P): DIN × 4; Y: 1.0 Vp-p, 75 ohms, sync negative; C (BURST): 0.286 Vp-p, 75 ohms

REF. VIDEO: BNC type × 2, loop through; SYNC: 0.286 Vp-p; BURST: 0.286 Vp-p

SDI INPUT: BNC type × 4 (with BKDF-701: × 8); 270 Mb/s, compliant with SMPTE-259M

DSK KEY IN: BNC type × 2, loop through; 1.0 Vp-p, 75 ohms, sync negative

Output signals

PGM OUT
SDI: BNC type × 2; 270 Mb/s, compliant with SMPTE-259M
COMPONENT: BNC type (Y/R–Y/B–Y) × 2; Y: 1.0 Vp-p, 75 ohms, sync negative; R–Y/B–Y: 0.756 Vp-p, 75 ohms
COMPOSITE: BNC type × 2; Video: 1.0 Vp-p, 75 ohms, sync negative
S-VIDEO: DIN × 2; Y: 1.0 Vp-p, 75 ohms, sync negative; C (BURST): 0.286 Vp-p, 75 ohms

CLEAN OUT: BNC type × 1; SDI: 270 Mb/s, compliant with SMPTE-259M

BLACK BURST OUT: BNC type × 3; SYNC: 0.286 Vp-p; BURST: 0.286 Vp-p

Control signals

EDITOR: D-sub, 9-pin × 1 (RS-422A)
GPI T 1/2: BNC type × 2, TTL level, active low
PANEL: D-sub, 25-pin × 1
TALLYL: D-sub, 25-pin × 1, relay contact output × 8
TERMINAL: USB × 1

Recommended equipment and cables

Editing control unit: PVE-500, BVE-900/910/2000, BVE-600
VTR: DSR-2000/2000P, DNW-75/75P
Audio mixer: SRP-V200R
Cables: RCC-5G/10G/30G 9-pin remote control cables

Supplied accessories

AC power cord (1)
25-pin control cable, 10 m (1)
Button labels (1 set)
Tool for removing key tops (1)
Operation manual (1)

Design and specifications subject to change without notice.

Glossary

A-roll edit
An edit using one player and one recorder for basic cut editing.

A/B roll edit
An edit using two players and one recorder, to permit special effects such as mix and wipe.

B–Y signal
A color difference signal. The blue signal minus the Y signal.

Background picture
In animation effects, the picture into which the foreground picture is inserted. In transition effects, the picture that is replaced as the effect progresses (FROM picture). The picture selected with the BACKGROUND bus buttons.

Background through mode
In the DFS-700/700P, an output mode in which the video input of the background bus and the video input of the foreground bus are mixed for output. Normally the two pictures are delayed by 1 frame, but in pre-read editing the background bus picture is delayed by 4 lines. Pre-read editing is enabled by inserting the input of the background bus into the output of the recorder VTR. In this state, the foreground bus input delay becomes 1 frame + 4 lines. Therefore, the VTR output that is inserted into the foreground bus must be read ahead by 1 frame.

Black burst
A sync signal composed of composite sync and burst signals.

Bus
An internal signal path. Signals selected for input to the bus are passed on to the next process.

Chroma
In colors, hue and saturation.

Chroma key
Key effect in which a particular color (usually a highly saturated blue) is used to cut holes in a background picture.

Color bar
A test signal displayed on a monitor screen as vertical stripes of different colors, used to adjust hue and saturation.

Color matte
An internally generated color signal with adjustable hue, saturation, and luminance.

Component signal
Video signal containing separate luminance (Y) and color difference (R–Y, B–Y) video components.

Composite signal
Video signal containing video, color burst, and sync signals.

Cross-point
An electronic switch where video signal lines cross. When the switch is closed, usually by pressing a button, multiple input signals and one or more output signals are allowed to pass.

Cut
An instantaneous switch from one picture to another, or the instantaneous insertion or deletion of a key signal.

Downstream key (DSK)
Effect used to superimpose characters or graphics over output signals. Called downstream key because superimposing takes place in the final stages of processing after other effects have been applied. Requires a key source signal to define the outlines of the characters or graphics, and a key fill signal to fill the outlines. *See also "title key".*

Editing control unit
A video editor with functions for remote control of VTRs, video switchers, audio switchers, and other video editing equipment.

Field
In the NTSC color television system, 262.5 horizontal scanning lines. Odd lines are scanned for the first field before returning to the top of the screen to scan even lines. A frame is composed of two fields: the odd and even fields.

Foreground picture
In animation effects, the picture inserted into the background picture. In transition effects, the picture left on the screen after the effect finishes (TO picture). The picture selected with the FOREGROUND bus buttons.

Frame
Two fields, containing all the information in a complete picture.

Frame synchronizer
A device used to bring the timing of unsynchronized video into conformance with a local reference signal.

Gen-lock
To synchronize output signals to an external sync signal.

GPI
Abbreviation of general purpose interface. An interface used to carry out remote control from editing control units lacking a formal interface.

Hue
The attribute of colors that allows them to be classified as red, green, blue, and so on. Red and pink have the same hue, but different saturations.

Key clip
In luminance keys, to specify a reference luminance level. The part of the signal above the reference level is used as the key source signal. *See also "key source".*

Key fill
A signal used to fill the hole cut with the key source signal.

Key frame
User program effect data which defines the effect at a specific point. User program effects are made up of sequentially executed key frames.

Key gain
The sensitivity of circuits, which can be adjusted with the switcher's key gain control. This is done to obtain the desired blurring of key edges.

Key invert
In luminance key, to reverse the polarity of a key source signal so that the hole is cut with the darker part of the signal.

Key mask
To hide part of a title key or downstream key signal so that only the desired part is used.

Key source
A signal used to cut a hole in a background picture for insertion of a key fill signal.

Luminance key
Key effect in which a luminance signal is used to define the outlines of characters or graphics.

Luminance signal
The part of a video signal that carries brightness information. Also called the Y signal.

Mix
Effect in which one signal fades in while another fades out. Also called dissolve.

Pre-read editing
A/B roll editing using the output (playback) of the recorder VTR and a player VTR.

Preroll
Running a videotape a certain distance before the edit IN point in order to bring the tape to a steady speed and synchronize it with other tapes.

Postroll
Running a videotape a certain distance past the edit OUT point in order to monitor the video that follows.

R–Y signal
A color difference signal. The red signal minus the Y signal.

RGB signal
A signal format in which red, green, and blue signals are transmitted separately. A separate sync signal may be sent, or the sync signal can be added to the green signal. The DFS-700/700P uses the latter method.

Saturation
The extent to which a color has been diluted by white. Pure red is fully saturated, while pink is diluted.

SDI
A serial component digital signal.

S-video signal
A video signal with separate luminance (Y) and chrominance (C) components. As opposed to composite video, S-video provides higher quality by eliminating interference between the Y and C signals.

Snapshot
Data containing the settings of specific controls on the control panel. Snapshots can be saved and recalled to restore the control panel to a desired state.

Subcarrier (SC)
The part of a video signal that carries color information. The amplitude represents saturation, and the relative phase against the color burst signal represents hue. Also called the color subcarrier.

Title key
Effect used to superimpose foreground characters or graphics on a background. Requires a key source signal to define the outlines of the characters or graphics, and a key fill signal to fill the outlines. *See also "downstream key".*

Transition
A period during which one picture is replaced by another, or a period during which a key is inserted or deleted.

Wipe
A transition effect in which one picture moves in to replace another. Often the new picture appears as a geometrical shape such as a circle or star.

YUV signal
An analog component signal, consisting of a luminance (Y) signal, a color difference signal U (B–Y) and a color difference signal V (R–Y).

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FS-700/700P

Sony Corporation

Printed in Japan

Printed on recycled paper

Sony Online http://www.world.sony.com/

Section 2
Service Overview

2-1. Installation

2-1-1. Operating Environment

Operating temperature	0 °C to 40 °C
Performance temperature	5 °C to 35 °C
Humidity	10 to 90 % (No condensation)

To prevent overheating of the DFS-700/700P, ensure that there is good air circulation around the unit.

CAUTION

Install in a stable location.
Installation on unstable or tilting surface may cause the unit fall off, resulting in injury.

2-1-2. Power Supply Specifications

Power voltage	AC 100 V to 240 V
Power frequency	50/60 Hz
Power consumption	200 W (Boards installed)
Rush current	AC 230 V IN : 13 A AC 240 V IN : 24 A

Note

AC power supply is required a capacity which is commensurate with rush current.
If the capacity of the AC power supply is not enough, the breaker of AC power of a supply side may operate or this unit may not operate normally.

2-1-3. Power Supply Cord

For customers in the U.S.A. and Canada
Required Part

① Power cord, 125 V 10 A (2.4 m): 1-557-377-11

For customers in Europe
Required Part

② Power cord, 250 V 10 A (2.5 m): 1-590-910-11

WARNING

Use a supplied power cord only.
Be sure to use a recommended power cord to avoid fire and/or an electric shock.

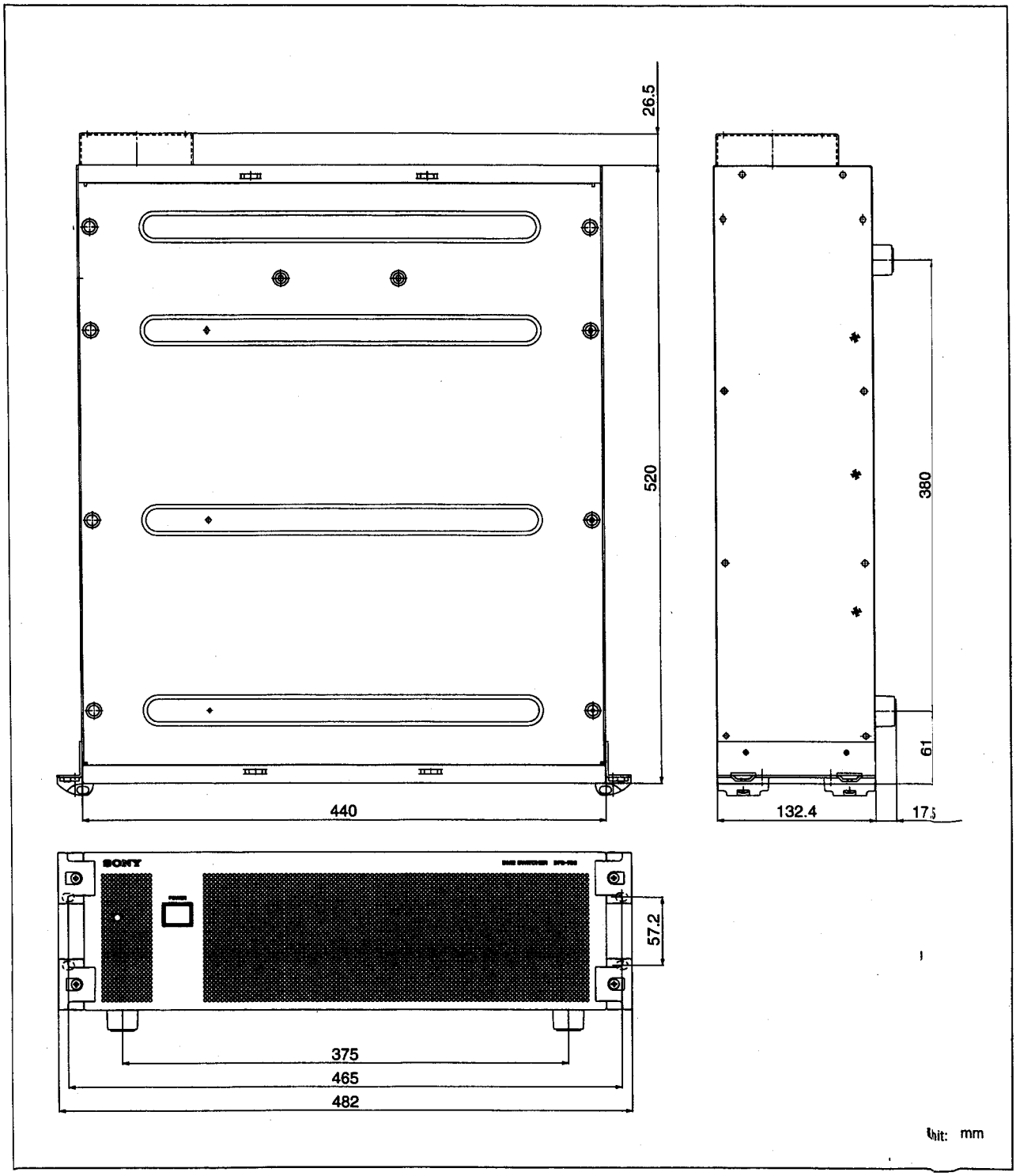
CAUTION

Ground the unit for your safety.
Be sure to attach a ground wire to avoid an electric shock.

2-1-4. Installation Space

Notes

- The rear side must be at least 400 mm away from the walls for ventilation and maintenance.
- Do not stop the fan or block the ventilator because this unit is air-cooled by the fan on the rear side. If not, a failure or trouble may occur.



2-1-5. Matching Connector and Cable

When connecting cable to the connectors, match those connectors or equivalent with each other as listed below.

DFS-700/700P side connector			Matching Connector and Cable	
Connector Function Name		Connector	Connector	Sony Parts No.
DIGITAL I/O				
PGM OUT	1, 2	BNC	BNC	1-569-370-12
SDI INPUTS	1 to 8	BNC	BNC	1-569-370-12
CLEAN OUT		BNC	BNC	1-569-370-12
ANALOG I/O				
PGM OUT	COMPOSITE 1, 2 PVW	3-BNC	3-BNC	1-569-370-12
	COMPONENT 1, 2 (Y, R-Y, B-Y)	3-BNC	3-BNC	1-569-370-12
	S VIDEO 1, 2	S VIDEO, Plug (F)	S VIDEO, Plug (M)	YC-30 V (3 m)
VIDEO INPUTS	COMPONENT 5/1 to 8/4 (Y, R-Y, B-Y)	3-BNC	3-BNC	1-569-370-12
	COMPONENT/COMPOSITE 5 to 8 (Y/V, R-Y, B-Y)	3-BNC	3-BNC	1-569-370-12
	REF. VIDEO(Loop-through)	BNC	BNC	1-569-370-12
	S VIDEO 5 to 8	S VIDEO, Plug (F)	S VIDEO, Plug (M)	YC-30 V (3 m)
DSK KEY IN	(Loop-through)	BNC	BNC	1-569-370-12
BLACK BURST OUT	1 to 3	BNC	BNC	1-569-370-12
GPI/T	1, 2	BNC	BNC	1-569-370-12
PANEL		D-sub, Plug 25P (F)	D-sub, Plug 25P (M)	(*)
TALLY		D-sub, Plug 25P (F)	D-sub, Plug 25P (M)	
EDITOR		D-sub, Plug 9P (F)	D-sub, Plug 9P (M)	1-560-651-00
TERMINAL		USB B-type (R) Receptacle	USB B-type (P) Plug	

(*) This Connector is attached to the cable of 10 m. (Sony parts No: 1-765-378-51)

2-1-6. Signal Input/Output

The input and output signals of the connectors on the rear panel are as described below.

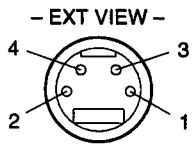
PGM OUT 1, 2

Connector: BNC
Output voltage: 800 mV p-p
Output impedance: 75 Ω

PGM OUT COMPOSITE 1, 2

Connector: BNC
Output voltage: 1.0 V p-p
Output impedance: 75 Ω

PGM OUT S VIDEO 1, 2 (S terminal 4-pin, Female)



Pin No.	Signal	Function
1	Y GND	Ground of luminance output
2	C GND	Ground of chrominance output
3	Y	Luminance output
4	C	Chrominance output

PGM OUT COMPONENT 1, 2

Connector: 3-BNC

Signal	Function
Y	Luminance output
R-Y	Chrominance R-Y output
B-Y	Chrominance B-Y output

PVW OUT

Connector: BNC
Output voltage: 1.0 V p-p
Output impedance: 75 Ω

CLEAN OUT

Connector: BNC
Output voltage: 800 mV p-p
Output impedance: 75 Ω

BLACK BURST OUT 1, 2, 3

Connector: BNC
Output voltage: Sync/Burst: 0.286 V p-p (NTSC)
Sync/Burst: 0.300 V p-p (PAL)
Output impedance: 75 Ω

DSK KEY IN (Loop-through)

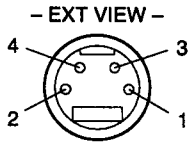
Connector: BNC
Input voltage: 1.0 V p-p (Sync: approx 0.3 V p-p)
Input impedance: High impedance or 75 Ω (with termination 75 Ω ON/OFF switch)

SDI INPUTS 1 to 8

Connector: BNC
Input voltage: 800 mV p-p
Input impedance: 75 Ω
*SDI 5 to SDI 8 require BKDF-701.

VIDEO INPUTS S VIDEO 5 to 8 (S terminal 4-pin, Female)

*BKDF-702/702P is required.



Pin No.	Signal	Function
1	Y GND	Ground of luminance input
2	C GND	Ground of chrominance input
3	Y	Luminance input
4	C	Chrominance input

VIDEO INPUTS COMPONENT 5/1 to 8/4

Connector: 3-BNC

① When the 8/4 input is set to YUV.

Connector	Function
Y	Y: Luminance input
R-Y	Color-difference signal R-Y: Chrominance input
B-Y	Color-difference signal B-Y: Chrominance input

② The 8/4 input when the 8/4 input is set to RGB. (Other inputs are the same as in step ①.)

Connector	Function
Y	Y: RGB signal G input (with Sync)
R-Y	R-Y: RGB signal R input
B-Y	B-Y: RGB signal B input

VIDEO INPUTS COMPONENT/COMPOSITE 5 to 8

Connector: BNC

① When BKDF-701 is installed

Connector	Function
Y/V	Y: Luminance input
R-Y	R-Y: Chrominance input
B-Y	B-Y: Chrominance input

② When BKDF-702/702P is installed

Connector	Function
Y/V	Composite input
R-Y	—
B-Y	—

REF. VIDEO (Loop-through)

Connector: BNC

Input voltage: PAL 0.45 V p-p
(Sync/Burst: 0.300 V p-p)
NTSC 0.43 V p-p
(Sync/Burst: 0.286 V p-p)

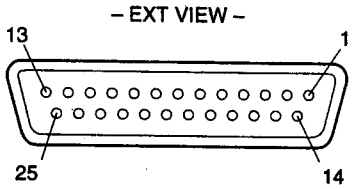
Input impedance: High impedance or 75 Ω (with termination 75 Ω ON/OFF switch)

GPI/T 1, 2

Connector: BNC

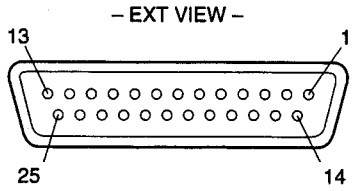
Input voltage: TTL level

PANEL (D-sub 25-pin, Female) (Processor)



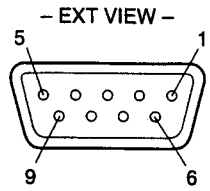
Pin No.	Signal	IN/OUT	Function
1	GND	—	Frame ground
2	DC CON	O	12 V output
3	KRD+	I	Receive data "B"
4	GND	—	Receive common
5	KTD+	O	Transmit data "B"
6	GND	—	Transmit common
7	RVD+	O	Transmit VD "B"
8	GND	—	Ground
9 to 10	—	—	—
11	GND	—	Ground
12	GND	—	Ground
13	GND	—	Ground
14	DC CON	O	12 V output
15	DC CON	O	12 V output
16	KRD–	I	Receive data "A"
17	GND	—	Receive common
18	KTD–	O	Transmit data "A"
19	GND	—	Transmit common
20	RVD–	O	Transmit VD "A"
21 to 24	GND	—	Ground
25	GND	—	Frame ground

PANEL (D-sub 25-pin, Female) (Control panel)



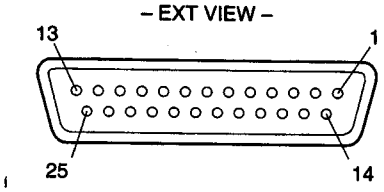
Pin No.	Signal	IN/OUT	Function
1	FG	—	Frame ground
2	+12 V	I	12 V input
3	MIT+	O	Transmit data "B"
4	GND	—	Transmit common
5	RCV+	I	Receive data "B"
6	GND	—	Receive common
7	RVD+	I	Receive VD "B"
8	GND	—	Ground
9	—	—	—
10	—	—	—
11	GND	—	Ground
12	GND	—	Ground
13	GND	—	Ground
14	+12 V	I	12 V input
15	+12 V	I	12 V input
16	MIT–	O	Transmit data "A"
17	GND	—	Transmit common
18	RCV–	I	Receive data "A"
19	GND	—	Receive common
20	RVD–	I	Receive VD "A"
21 to 24	GND	—	Ground
25	FG	—	Frame ground

EDITOR (D-sub 9-pin, Female)



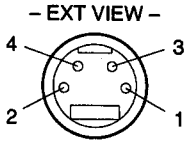
Pin No.	Signal	IN/OUT	Function
1	GND	—	Frame ground
2	TXA	O	Transmit "A"
3	RXB	I	Receive "B"
4	GND	—	Receive common
5	—	—	—
6	GND	—	Transmit common
7	TXB	O	Transmit "B"
8	RXA	I	Receive "A"
9	GND	—	Frame ground

TALLY (D-sub 25-pin, Female)



Pin No.	Signal	IN/OUT	Function
1	TL1A	O	Video input 1 Tally
2	TL1B	O	
3	TL2A	O	Video input 2 Tally
4	TL2B	O	
5	TL3A	O	Video input 3 Tally
6	TL3B	O	
7	TL4A	O	Video input 4 Tally
8	TL4B	O	
9	TL5A	O	Video input 5 Tally
10	TL5B	O	
11	TL6A	O	Video input 6 Tally
12	TL6B	O	
13	GND	—	Frame ground
14	—	—	—
15	TL7A	O	Video input 7 Tally
16	TL7B	O	
17	TL8A	O	Video input 8 Tally
18	TL8B	O	
19	—	—	—
20	—	—	—
21	—	—	—
22	—	—	—
23	—	—	—
24	—	—	—
25	GND	—	Frame ground

TERMINAL (USB B-type, Receptacle)



Pin No.	Signal	IN/OUT	Function
1	Vcc (not used)		
2	D–	I/O	Data–
3	D+	I/O	Data+
4	GND	—	Frame ground

2-1-7. Rack Mounting

The DFS-700/700P can be mounted on a 19-inch standard rack for use.
Mount the DFS-700/700P on the rack properly in the procedure below using a specified rack mounting kit.

Specified rack mounting kit: RMM-10

Note

The DFS-700/700P may not be able to be mounted on a 19-inch standard rack using a rack mounting kit other than the specified one.

Components of RMM-10

- Rack brackets ..... 2 pieces
- Rack mounting adaptor (right) ..... 1 piece
  [Including two screws (B 4×6: 7-682-560-09)]
- Rack mounting adaptor (left) ..... 1 piece
  [Including two screws (B 4×6: 7-682-560-09)]
- Rack bracket fixing screws (B 4×6: 7-682-560-09)
  ..... 6 pieces
- Adaptor fixing screws (B 4×10: 7-682-560-10)
  ..... 6 pieces

1. Notes on Rack Mounting

WARNING

- Fix the rack on the horizontal and firm floor with bolts to prevent it from turning over or moving.
  If the rack overturn due to the weight of the unit, this may cause a death or serious injury.
- Use the specified rack mounting kit.
  If not, the unit may fall because of insufficient strength. This causes an injury.
- After rack mounting, be sure to tighten the screws of the rack angle and fix this unit to the rack.
  If not, this unit may slide and fall from the rack. This causes an injury.

CAUTION

Attention when this unit is installed in the rack:

- Mount the unit with two or more persons.
- Be careful not to put your hand or finger in the rack mount rail.
- Install in a stable posture.

Note

Install a ventiloting fan in the rack to prevent the increase in the temperature inside a rack when multiple units are put in one rack.

2. Rack Mounting Procedure

Explains the procedure for rack mounting by Rack Mount Kit RMM-10.

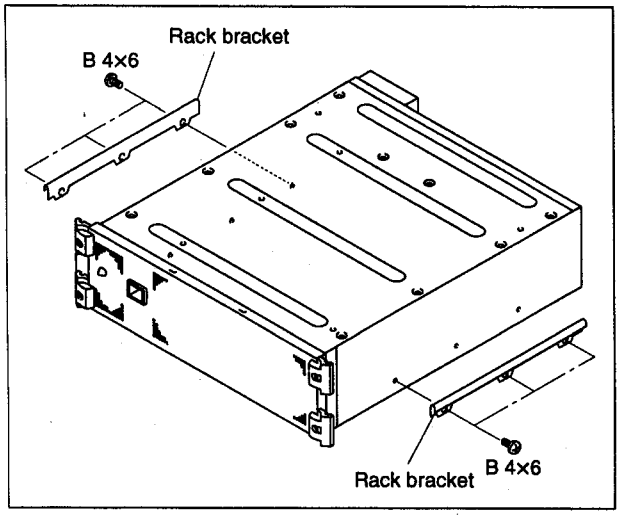
Note

Fasten the screws at the tightening torque below.
Tightening torque: 1.2 N•m {12.2 kgf•cm}

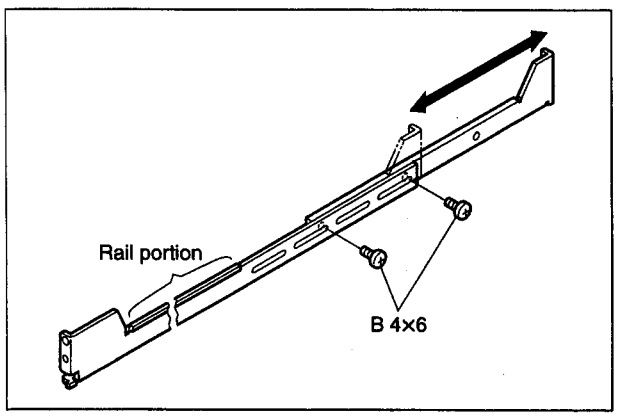
(1) Attach the rack brackets at the side panels of the processor with the specified six screws.

Note

Be sure to use B4×6 as a screw.



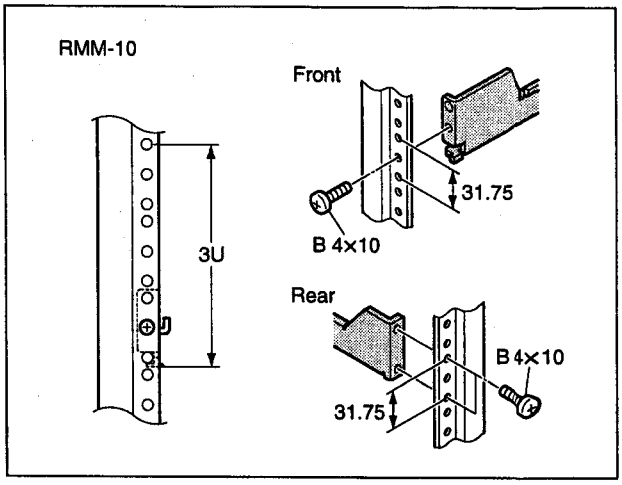
(2) Loosen the screws at the rear of the each adaptor and adjust each adaptor length to the rack depth.
(Following figure is case of left side.)



Note

The maximum depth of an adaptor is 750 mm.
The minimum depth of an adaptor is 595 mm.

(3) Firmly lay the right and left adaptors in the rack with the specified six screws.
(Following figure is case of left side.)



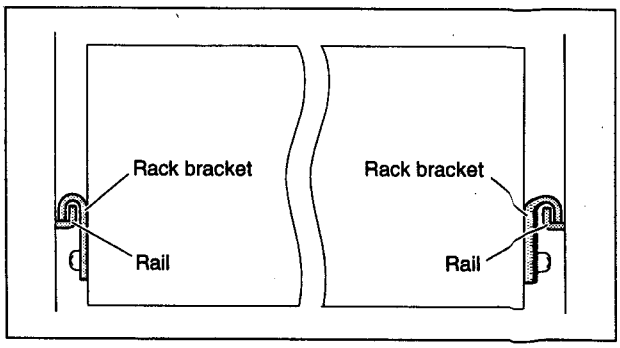
(4) Fasten the length adjustment screws which are loosened in step (2).

(5) Remove the front panel of the processor. (Refer to Section 2-2.)

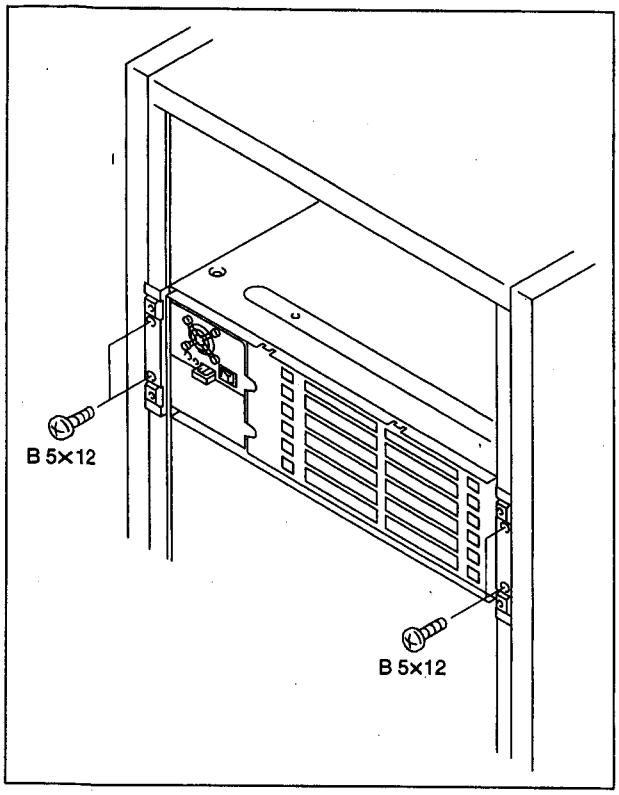
(6) Align the crook of each rack bracket on the side panels of the processor with the rail, then slide the processor backward.

Note

Each rack bracket covers the rails as shown in the figure below.



(7) Fix the unit to the rack with the specified screws and ornamental washers.



(8) Install the front panel.(Refer to Section 2-2.)

2-1-8. Installing Optional Board

1. Inserting of Plug-in Boards (BKDF-701/702/702P)

CAUTION

To avoid shock hazards and/or damage to the mounted circuit boards, be sure to turn off the power switch before inserting or pulling out the plug-in boards.

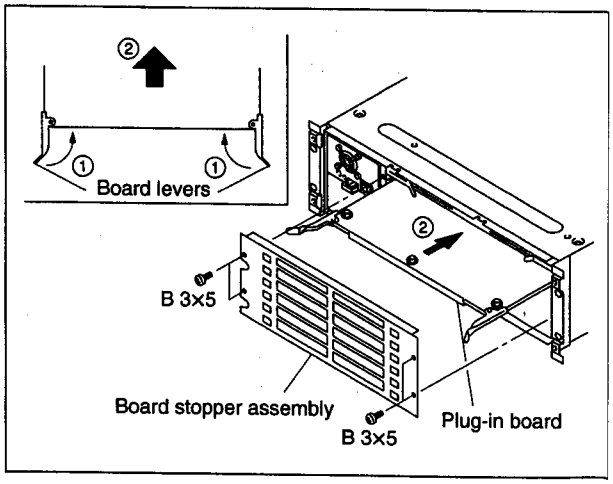
BKDF-701 and BKDF-702/702P are installed in slot No. 2 (the second slot from the top). BKDF-701 and BKDF-702/702P cannot be installed in the same processor unit.

(1) Remove the front panel. (Refer to Section 2-2.)
(2) Remove the four screws and then remove the board stopper assembly.
(3) Insert the plug-in board into slot No. 2 with the board levers opened.

Note

Insert the board while applying an equal force to the both board levers.

(4) Push the plug-in board in the direction of the arrow ②, then close the board levers in the direction of the arrow ①.



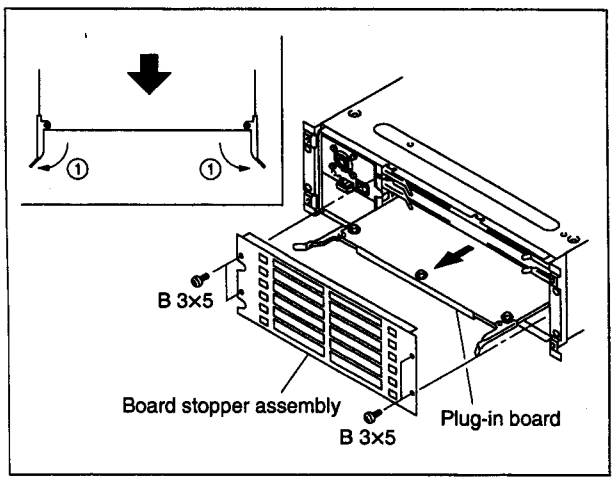
(5) Install the board stopper assembly and front panel.

2. Installing the BKDF-711/712

CAUTION

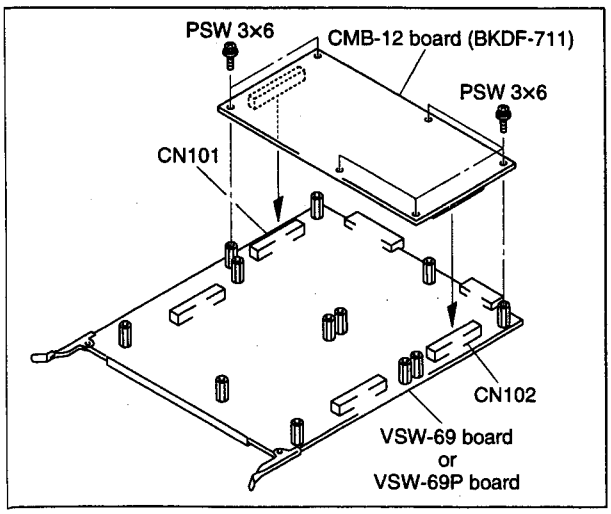
To avoid shock hazards and/or damage to the mounted circuit boards, be sure to turn off the power switch before inserting or pulling out the plug-in boards.

(1) Remove the front panel. (Refer to Section 2-2.)
(2) Remove the four screws and then remove the board stopper assembly.
(3) Open the board levers in the direction of the arrow ① and remove the VSW-69/69P board from slot No. 4 (the fourth slot from the top).



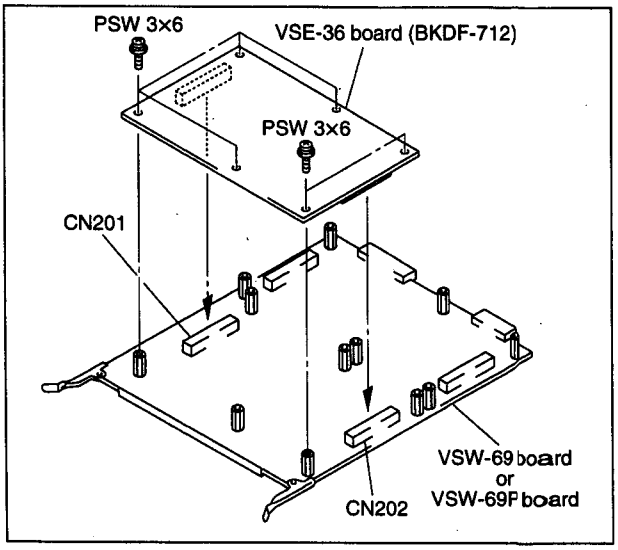
Installing the BKDF-711

(4) Connect the connectors on the CMB-12 board firmly to the connectors (CN101 and CN102) on the VSW-69/69P board.
(5) Fix the CMB-12 board to the VSW-69/69P board with the six screws supplied in BKDF-711.



Installing the BKDF-712

(6) Connect the connectors on the VSE-36 board firmly to the connectors (CN201 and CN202) on the VSW-69/69P board.
(7) Fix the connectors to the VSW-69/69P board with the six screws supplied for BKDF-712.



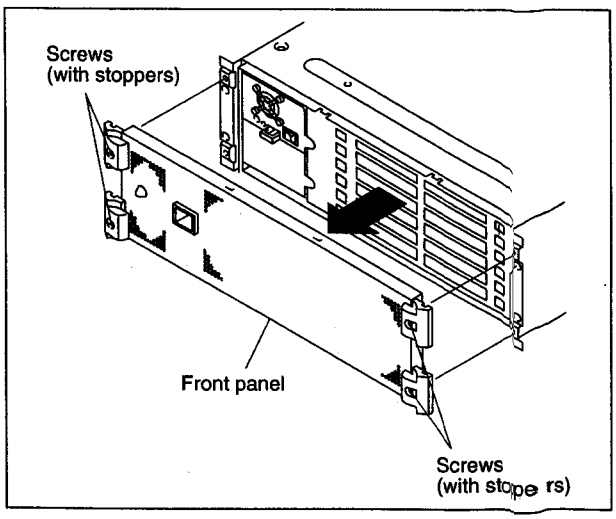
(8) Install the VSW-69/69P board in slot No. 4.
(9) Install the board stopper assembly and front panel.

Note

BKDF-711 and BKDF-712 can also be installed on the same VSW-69/69P board.

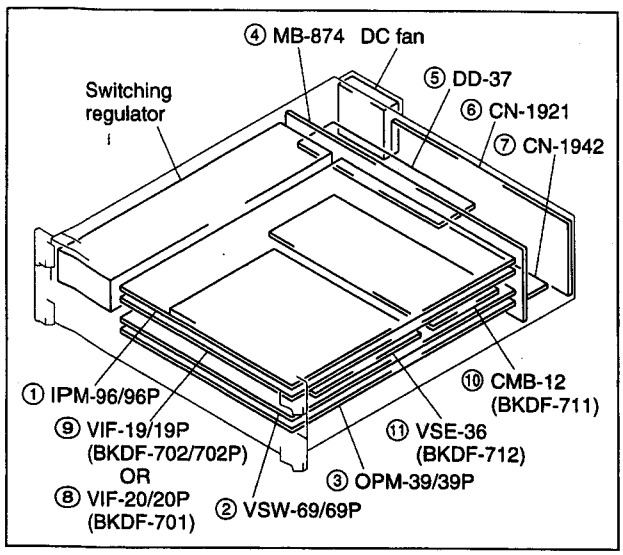
2-2. Removal of Cabinet

Remove the four screws (with stoppers) and then remove the front panel in the direction of the arrow.



2-3. Location of Main Parts

Processor Unit



Control Panel

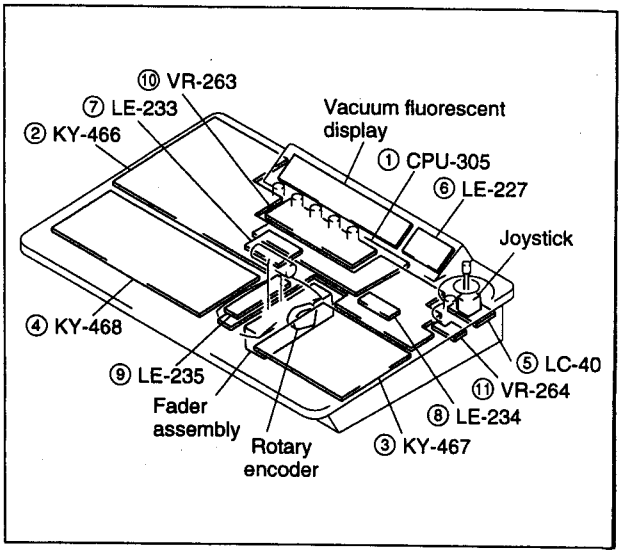


Fig No.	Board name	Function
①	IPM-96/96P	Input processor board
②	VSW-69/69P	Video processor board
③	OPM-39/39P	Output processor board
④	MB-874	Motherboard
⑤	DD-37	DC-DC conversion board
⑥	CN-1921	Connector board
⑦	CN-1942	Connector board
⑧	VIF-20/20P (BKDF-701)	Digital analog input board
⑨	VIF-19/19P (BKDF-702/702P)	Analog composite input board
⑩	CMB-12 (BKDF-711)	Digital multi effects board
⑪	VSE-36 (BKDF-712)	3D video mapping effects board

Fig No.	Board name	Function
①	CPU-305	CPU board
②	KY-466	Switch board
③	KY-467	Switch board
④	KY-468	Switch board
⑤	LC-40	Joystick board
⑥	LE-227	Display LED board
⑦	LE-233	7-segment LED board
⑧	LE-234	7-segment LED board
⑨	LE-235	LED board
⑩	VR-263	Volume board
⑪	VR-264	Volume board

2-4. Circuit Description

2-4-1. Processor

1. CMB-12 Board (2 Channel Digital Multi-effect Board)

V2 (FRGD) and K2 (TITLE) signals are processed on the CMB-12 board.

The V2 signal is used as an FRGD signal so as to perform the color collector processing, border addition, beveled edge addition, and two-dimensional low-pass filter processing.
In the title mode, the K2 signal is used as a key signal. After key processing, the key signal is used as a wipe key by a wipe generator so as to transform the two-dimensional low-pass filter processing. After the processing, the FRGD and key signals are written in DME memory. For the read address of DME memory data, the generator circuit varies depending on the two types of effects below.
(1) 2D, 3D nonlinear effect
(2) 3D mapping effect (when the VSE-36 board is installed)
The read data is interpolated for lighting. The data is then combined using the key signal from the VSW-69/69P board and the key signal processed on the CMB-12 board. The resultant FRGD and key signals are sent to the VSW-69/69P board.

2. DD-37 Board (DC-DC Converter)

In the DD-37 board, a power supply of +12 V is converted into the voltage used in each circuit.
The 12 V power supply output from an AC-DC power unit is converted into the voltages (+5 V, +3.3 V, +7 V, and −7 V) required in each circuit.

IC3, IC4, and IC5 are dual switching regulator control ICs. One IC can control two power outputs. IC3 controls +5 V-1 and +5 V-2 outputs, and IC4 controls +5 V-3 and +3.3 V-2 outputs. IC5 controls +7 V and −7 V outputs. For the maximum load current of each output voltage, +5 V and +3.3 V are 10 A, and +7 V and −7 V are 3 A.

3. IPM-96/96P Board (Input Processor Board)

The IPM-96/96P board is used to input the SDI, component (Y, R-Y, B-Y), and component (RGB) signals for DFS-700/700P. The IPM-96/96P board mounts a four-channel SDI circuit and four-channel component circuit. A video signal is sent to the BG and FG buses by the switching of a crosspoint.

The IPM-96/96P board accepts three input signals; SDI signals (270 Mbps), component (Y, R-Y, B-Y) signals, and component (RGB) signals. Four-channel SDI signals, four-channel component (Y, R-Y, B-Y) signals, and RGB signals can be assigned to channels 1 through 8 of a crosspoint. For the one-channel analog signal input to the 8/4 component input connector, a component (Y, R-Y, B-Y) signal or component (RGB) signal is selected according to the format.

(1) Signal input block
An SDI input signal is directly converted into 4:2:2 parallel signal of an eight-bit by an SDI input IC and sent to the next stage.
For a component signal input, an RGB-to-Y, R-Y, B-Y conversion circuit is added to only the 8/4 input connector. The analog component signal can be input based on an RGB or Y, R-Y, B-Y signal system by the selection of a format. As a result, all analog input signals become Y, R-Y, B-Y signals. In each channel, these signals are analog-to-digital converted by the same circuit processing system and sent to the next stage as 4:2:2 parallel signal of an eight-bit.

(2) Analog input block

The analog input block on the IPM-96/96P board can accept four-channel component input signal. Basically, the analog input block receives Y, R-Y, and B-Y signals. Only the fourth channel is provided with an RGB-to-Y, R-Y, B-Y conversion circuit and selection circuit so that it can also receive an RGB component signal. Therefore, the circuit stage after the selection circuit in the fourth channel is the same in each channel. Only the first channel is described below as an example.
A Y signal is passed through a 5.5 MHz low-pass filter, converted into the proper value in a signal level, and fed to the A/D converter by AC coupling. Color difference signals R-Y and B-Y are passed through a Y/C delay adjustment circuit and 2.5 MHz low-pass filter, converted into the proper value in level, and sent to the A/D converter by AC coupling. A/D converter IC107 is an eight-bit Y, R-Y, B-Y simultaneous conversion output circuit incorporating a clamp function. In the case of reference voltage for A/D conversion, a top voltage of 3.5 V and a bottom voltage of 1.5 V are supplied using a reference voltage generator circuit and operational amplifier. For the phase relation at the input end of the A/D converter, a Y signal is supplied in the state where it is advanced 222 ns (corresponding to three clocks of a 13.5 Mbps digital clock) with respect to a R-Y, B-Y signal. When the Y signal is converted into a digital signal, only the Y signal is delayed by three clocks (222 ns) for phase adjustment. Since the Y signal has a high frequency band, the delay in an analog circuit is disadvantageous in frequency characteristics and is processed by a digital circuit. Moreover, the digital output Y signal of the A/D converter is converted in a digital level by a ROM table so as to select the level difference in NTSC-J, NTSC-UC, and PAL. The level is converted (expanded) for NTSC-UC only.

(3) Input conversion clock generation block

Each input circuit requires a 4:2:2 digital clock (13.5 MHz) synchronized with an input analog signal. Therefore, each channel has a clock generator circuit in the input block. The signal just before entering the A/D converter is taken out from the Y signal system of an input signal and composite sync information is extracted using a sync separator circuit. One of the extracted information generates a clamp pulse for clamping an input signal. The other is passed through a half H killer circuit and then connected to a clock generation PLL circuit of 27 MHz via the video phase adjustment circuit during digital conversion. As a result, clocks of 27 MHz and 13.5 MHz and H start pulses are generated.

(4) Digital level conversion block

On the IPM-96/96P board, the input level is multiplied by 1.08 (expanded in level proportionally to the setup elimination) in the NTSC-UC mode using a ROM table after A/D conversion. This is the level conversion by digital processing. Using this system, the setup elimination can also be simultaneously processed without changing the clamp operation and function required until the A/D converter is used. This system is thus very efficient. The DFS-700/700P is designed so that data completely returns to the former state between the input and output (expansion to reduction) and coincides with each other. Therefore, this ensures the satisfactory characteristics of waveforms.

(5) TBC block

After an SDI input signal is converted from serial to parallel, it is input to the line memory. After a component input signal is converted from analog to digital, it is input to the line memory. In this line memory, the TBC block having a lead-in range of −0.3 to +1.3 H from a REF signal as reference is constituted. On the write side, the line memory is written in the phase of an input signal. On the read side, it is read in the lead-in timing described above. As a result, on the read side, all input channels are adjusted to the same phase. Similarly, after a component input signal is converted from analog to digital, all channels become in phase with an SDI input by the output of line memory. The write and read control signals of the line memory are generated based on internal HD and VD pulses using memory control circuits (IC1320 to IC1323, IC1330, and IC1331).

(6) Crosspoint block

The input signal of a crosspoint on the IPM-96/96P board is a four-channel SDI input signal and four-channel component input signal. When the VIF-20/20P board is installed, the four-channel SDI input signal or four-channel component signal of the VIF-20/20P board is used as the input signal of a crosspoint. When the VIF-19/19P board is installed, the four-channel composite input signal or four-channel S video input signal of the VIF-19/19P board, and a memory bus and internal video signal are used as the input signal of a crosspoint. The output signal of a crosspoint is V1, K1, V2, K2, V3, and BG buses passed to the VSW-69/69P board, a DSKF bus passed to the OPM-39/39P board, and a memory bus used as the input signal of the frame memory on the IPM-96/96P board.

(7) Frame memory block

The frame memory block freezes an input signal. The frozen video signal is used as one of the input signals in a crosspoint. When the input signal selected at the crosspoint is input from the memory bus to the frame memory circuit, it is separated into luminance and color-difference signals and written in the frame memory. The frame memory consists of four field memories and memorizes the luminance and color-difference signals separately in units of fields. After the luminance and color-difference signals are read, they are multiplexed and then output. For frame freezing, the luminance and color-difference signals are alternately read from memory in units of fields. For field freezing, odd and even field freezes are available. One field is read at all times. In the other field, two lines are added for interpolation. A two-line addition line buffer (IC1209) and adder (IC1208) are used as this circuit. The control signal of the frame memory is generated based on internal FD and VD pulses using memory control circuits (IC1322, IC1324, IC1326, and IC1333).

(8) CPU interface block

The IPM-96/96P board sets the mode selection or initial value by communicating with CPU (IC901) on the VSW-69/69P board. After IC1327 receives the data, address, and control signal from CPU and decodes them, it sends a chip select and set value to the SIF control circuit.

4. OPM-39/39P Board (Output Processor Board)

The OPM-39/39P board outputs the DME, PVW, and KEY signals input from the VSW-69/69P board as an SDI or analog (component, S video, or composite) format signal. The OPM-39/39P board mounts a DSK circuit that mixes a DSK video signal with the DME signal. This board also has an external reference sync circuit and black burst output circuit as well as an internal sync generator.

The OPM-39/39P board consists of the following blocks.

(1) Gen-lock/system clock

This block generates the reference signals required for DFS-700/700P, such as internal signals (FD, VD, HD, BLK, CKF (27 MHz), and CKM (13.5 MHz) or an external output black burst signal. Each output signal operates with the sync signal of a sync generator (IC103) as the source. In the operation mode, there are an EXTERNAL GEN-LOCK mode that is gen-locked to the sync signal (VBS or BS) supplied from an external signal oscillator and an INTERNAL mode that internally generates a sync signal. When a sync signal is sent to the REF. VIDEO input connector on the rear panel, the unit automatically enters the EXTERNAL GEN-LOCK mode.

(2) DSK (Down Stream Keyer)

This block generates the key signal required for mixing a DME signal and DSK video signal. In addition to the component key signal input from the DSK KEY input connector on the rear panel, the self-key obtained when only a Y signal is extracted from a DSK fill signal can also be selected for a DSK source signal. The DSK source signal is adjusted in gain and clip, and masked, using a key processor (IC301). A fill key (FLK') signal that mixes the DSK fill signal with a border mat signal and a downstream key (DK) signal that is required for mixing with the DME signal are generated in the next-stage border processor (IC310) using a five-line key signal.

(3) DSK M/E, FTB

The mixing operation of a DME signal and DSK video signal, and the FTB (feed-to-black) operation are performed in this block.

A DSK fill (or DSK mat) signal and border mat signal are first mixed with the fill key signal used as a coefficient. The PGM signal obtained when a DSK video signal with border is inserted into the DME signal is produced by this processing. The PGM signal is mixed for performing the FTB operation to a color mat signal and sent to the SDI and analog output circuit blocks. The signals (CLEAN, PVW, and KEY) output to the CLEAN connector are also selected by this block.

(4) OUTPUT

This block outputs PGM, CLEAN, PVW, and KEY signals as an SDI or analog format signal.

In an SDI output system, there are a PGM signal and a signal output to the CLEAN connector. After V BLANKING addition and WHITE/DARK clipping are performed via this path using output processors (IC408 and IC504), these signals are converted from parallel to serial and then output.

There are PGM and PVW signals in an analog output system. In the PGM path, a (eight-bit, 27 MHz) digital signal is separated into Y, V, and U signals and converted into an analog signal using a D/A converter. On the basis of the converted signal, component, S video, and composite signals are produced for output. Unlike the PGM path, in the PVW path, a digital signal is converted into a composite signal by one LSI (IC808).

The following signals can be output from the output connector on the rear panel according to the signal formats below.

PGM output signal	SDI signal	2 channels
	Component signal	2 channels
	Composite signal	2 channels
	S video signal	2 channels
PVW output signal	Composite signal	1 channel
CLEAN output signal (CLEAN, PVW, or KEY signal)	SDI signal	1 channel
Black burst output signal		3 channels
Tally output signal		8 outputs

(5) CPU interface

This block interfaces with the IC and local CPU on the OPM-39/39P board.

This block decodes the control signal generated by CPU using FPGA (IC805) and generates a control signal according to the way to control the IC. It also passes the information on the NTSC/PAL distinction and NTSC J/NTSC UC model to CPU via FPGA.

5. VIF-19/19P Board (Analog Composite and S Video Input Board)

The VIF-19/19P board is used for inputting the analog composite and S video signals of DFS-700/700P. The VIF-19/19P board decodes the input composite signal and converts it into a D1 digital signal. This board also has a frame synchronizer function and uses an input signal as the signal synchronized with a reference signal. The output signal is sent to the IPM-96/96P board.
The VIF-19/19P board mounts a four-channel analog composite or S video input circuit. In each channel, an analog composite input signal or S video input signal can be independently selected in the setup menu. One channel is described below.

The circuit consists of a sync separator circuit, 13.5-MHz clock generation block, subcarrier clock generation block, Y/C separation and decode block, D1 encoder block, and frame synchronizer block.

The analog composite and S video input signals have an individual input connector on the rear panel. These signals can be simultaneously input to the VIF-19/19P board. On the VIF-19/19P board, two input signals are selected by controlling the setup menu.

The selected signal branches into two paths. One is input to the sync separation circuit so as to detect horizontal and vertical sync signals. After that, in the 13.5-MHz clock generation block, the signal generates a 13.5-MHz clock for the D1 signal synchronized with a horizontal sync signal.

The other is input to the Y/C separation and decode circuit. In the subcarrier clock generation block, the signal generates the clock of the subcarrier frequency, multiplied by four, that was synchronized with a burst signal. After that, a composite signal is converted from analog to digital, Y/C-separated, and decoded by this clock. The resultant signal is converted from digital to analog again to produce an analog component signal. The Y/C separation is based on an adaptive two-dimensional system in which three lines are used. For the S video signal, only a chroma signal is converted from analog to digital and decoded digitally by this clock. The resultant signal is converted from digital to analog again to produce analog B-Y and R-Y signals. For a Y signal, the input analog signal is used directly.

The analog component signal is adjusted in phase and gain and converted from analog to digital using the 13.5-MHz clock described above to produce a D1 digital signal.

A frame synchronizer is constituted for each signal Y and C. The frame synchronizer consists of two FIFOs of 384 K × 8 bits, respectively. The signals are written in FIFO using the clock synchronized with an input signal and read using the clock synchronized with a reference signal. The input signal synchronized with a reference signal is delayed by about 1 to 3 H in this portion, but absorbed by other boards. Therefore, in the system, the delay will not increase by passing through the frame synchronizer.

6. VIF-20/20P Board (SDI and Analog Component Input Board)

The VIF-20/20P board is an optional expansion board for inputting the SDI and analog component signals of DFS-700/700P. The VIF-20/20P board mounts a four-channel SDI input circuit or four-channel analog component input circuit. The SDI or analog component input signal is sent to the IPM-96/96P board as a four-channel 4:2:2 component parallel digital signal. In each channel, the SDI input signal or analog component input signal can be independently selected according to the format.

(1) Signal input block

There are four channels in an SDI input circuit. An SDI input signal is directly converted into an eight-bit, 4:2:2 parallel signal. There are also four channels in a component input circuit. Finally, the signals in each channel are converted into eight-bit, 4:2:2 parallel signals by the same circuit system. The signals in four channels are selected together with the signal from the SDI input circuit and sent to the next-stage TBC circuit. The analog component input circuit generates a clock of 27 MHz synchronized with an input signal, regulates the level and delay value, and converts the signal from analog to digital.

(2) Analog input block

The analog input block on the VIF-20/20P board is basically almost the same in configuration as for the IPM-96/96P board. The circuit configuration is almost the same as that obtained when a component (RGB) signal input converter added to only the fourth channel is removed from the circuit configuration of the IPM-96/96P board and when a level selection circuit for each signal format is inserted into each four-channel color-difference (R-Y and B-Y) signal system. Therefore, the relevant circuit configuration is explained below. For other configuration, refer to "(2) Analog Input Block" of the IPM-96/96P board.

A video selection circuit of 3 × 1 is inserted in each four-channel color-difference signal system. On the input side, a chroma signal is precisely divided by a high-precision resistor so as to select the level using a selection signal and sent to the next stage. In the case of the chroma signal, the input level for making the same in level as 75% color bars of an SDI signal is 756 mV for NTSC J, 700 mV for NTSC UC, and 525 mV for PAL. As a result, the system operates so that the output level of a selector circuit is constant in any input level. This shows that the setting of a chroma signal level does not vary depending on the format used.

(3) Input conversion clock generation block

Each input circuit requires a 4:2:2 digital clock (13.5 MHz) synchronized with an input analog signal. Therefore, each channel has a clock generator circuit in the input block. The signal just before entering the A/D converter is taken out from the Y signal system of an input signal and composite sync information is extracted using a sync separator circuit. One of the extracted information generates a clamp pulse for clamping an input signal. The other is passed through a half H killer circuit and then connected to a clock generation PLL circuit of 27 MHz via the video phase adjustment circuit during digital conversion. As a result, clocks of 27 MHz and 13.5 MHz and H start pulses are generated.

(4) Digital level conversion block

On the VIF-20/20P board, the input level is multiplied by 1.08 (expanded in level proportionally to the setup elimination) in the NTSC-UC mode using a ROM table after A/D conversion. This is the level conversion by digital processing. Using this system, the setup elimination can also be simultaneously processed without changing the clamp operation and function required until the A/D converter is used. This system is thus very efficient. The DFS-700/700P is designed so that data completely returns to the former state between the input and output (expansion to reduction) and coincides with each other. Therefore, this ensures the satisfactory characteristics of waveforms.

(5) TBC block

After an SDI input signal is converted from serial to parallel, the video signal selected according to the format is input to the line memory. After a component input signal is converted to analog to digital, the video signal selected according to the format is input to the line memory. In this line memory, the TBC block having a lead-in range of −0.3 to +1.3 H from a REF signal as reference is constituted. On the write side, the line memory is written in the phase of an input signal. On the read side, it is read in the lead-in timing described above. As a result, on the read side, all input channels are adjusted to the same phase. Similarly, after a component input signal is converted from analog to digital, all channels are adjusted to the same phase by the output of line memory. The write and read control signals of the line memory are generated based on internal HD and VD pulses using memory control circuits (IC1309, IC1320, IC1321, and IC1323). The output video signal of the TBC block is sent to the IPM-96/96P board and input to the crosspoint.

(6) CPU interface block
The VIF-20/20P board sets the mode selection or initial value by communicating with CPU (IC901) on the VSW-69/69P board. After IC1327 receives the data, address, and control signal from CPU and decodes them, it sends a chip select and set to the SIF control circuit.

7. VSE-36 Board (3D Mapping Effects Board)

The VSE-36 board is used to realize a three-dimensional mapping effect. This board consists of an address generation block and texture memory block.

The address generation block can be divided into a CPU block and rendering block. The CPU block consists of CPU (IC501), program flash memories (IC601 to IC605), SDRAMs (IC612, IC613, IC615, IC616), and dual port RAM (IC510). The rendering block consists of DDA (IC401), address memories (IC413 to IC420) and address memory controllers (IC105, IC106, and IC109).

The CPU block receives the information (e.g., system set information, effect pattern number, fader position, etc.) required for effect generation from the main CPU on the VSW-69/69P board via dual port RAM and transforms the three-dimensional object creation, geometry processing, and lighting calculation for each vertex.

The rendering block expands the vertex data from a CPU (IC901) block to the information based on units of pixels by DDA and draws it on the address memory. The address memory controller reads the drawn address information and sends it to the texture memory block on the VSE-36 board, or the VSW-69/69P and CMB-12 boards. The address memory has a double-buffer configuration. Therefore, drawing and reading are alternately switched for each field.

The texture memory block consists of a demultiplexer (IC105), color collector (IC251), border mixer (IC253), low-pass filters (IC201 and IC208), texture memory controllers (IC301 and IC306), and texture memories (IC302 to IC305, and IC307 to IC310).
In the texture memory block, color collector processing, border addition, and two-dimensional low-pass filter processing are performed for the V3 signal (8-bit, 27 MHz) sent from the VSW-69/69P board as a texture video source. After that, the signal is written in texture memory. The texture memory controller reads the written data using the address generated by an address generation block, interpolates the data, and send it to the VSW-69/69P board. The texture memory has a double-buffer configuration. Therefore, writing and reading are alternately switched for each field.

8. VSW-69/69P Board (Processor Board)

The VSW-69/69P board consists of a signal processing block and CPU block. This board transforms the DME processing according to the control panel operation.
V1, K1, BG, V2, K2, and V3 signals (8-bit, 27 MHz) are input from the IPM-96/96P board to the VSW-69/69P board.
The signal processing block processes the V1, K1, and BG signals and outputs PGM, KEY, and PVW signals to the OPM-39/39P board.
The V1 signal is used as an FRGD signal so as to transform the color collector processing, border addition, beveled edge addition, and two-dimensional low-pass filter processing.

In the title mode, the K1 signal is used as a key signal. After key processing, the K1 signal is used as a wipe key by a wipe generator so as to perform the two-dimensional low-pass filter processing.
The FRGD and key signals in which the two-dimensional low-pass filter processing was carried out are written in DME memory. For the read address of DME memory data, the generator circuit varies depending on the three types of effects below.
(1) 2D, 3D, and nonlinear effects
(2) Sparkle effect
(3) 3D-mapping effect (when the VSE-36 board is mounted)
The read data is interpolated for lighting.
The signal immediately after lighting for luminance and chroma signals and the signal immediately after interpolation for a key signal are sent to the VSW-69/69P board's later stage and the CMB-12 board in parallel.
The resultant signal is passed through a selection circuit and trailing block for the signal from the optional CMB-12 board. In a specific effect, the signal is then given later-stage wiping and later-stage border processing and mixed with a BKGD signal.
The signal that gave color collector processing to a BG signal and of which phase was adjusted to an FRGD signal via field memory is used as the BKGD signal.

The CPU block consists of CPU (IC901), a program, data flash memories (IC920 to IC924, IC941, IC942), SDRAMs (IC909 and IC910), dual port memory (IC912), SRAM (IC911), and a USB controller (IC932). The SRAM is backed up by a capacitor, storing the crosspoint state, effect parameters, or snapshot data.
The CPU block calculates the register set value of hardware from each effect parameter and writes it in the specified position inside the dual port memory. Moreover, the CPU block sets hardware with respect to the IPM-96/96P, OPM-39/39P, VIF-19/19P, and VIF-20/20P boards.
The CPU block also communicates with the external equipment such as a control panel, edit controller, and personal computer using a 2-channel serial port and USB interface.

2-4-2. Control Panel

1. CPU-305 Board

The CPU-305 board is the system control board on the control panel of DFS-700/700P. The CPU-305 board communicates with a processor unit via RS-422, scans switches, and displays indication elements such as LED/VFD (vacuum fluorescent display). The CPU-305 board mainly consists of the following circuit blocks.
- CPU and CPU's peripheral circuit
- DC-DC converter block
- External communication interface block
- Switch scan/LED lighting interface block
- Parallel interface block

(1) CPU and CPU's peripheral circuit
CPU uses a 16-bit microprocessor (IC21) in a clock of 16 MHz. CPU consists of 4 M-bit flash memory (IC51) in which a boot loader is stored, 4 M-bit flash memory (IC54) in which system control software is stored, two 512 k-bit work SRAMs (IC52 and IC53), and an address decoder (IC26) that generates memories, parallel interface chip select signals, or read/write control signals.

(2) DC-DC converter block
Powers of +5 V and +7 V are produced from +12 V, that is input from a processor unit, using the DC-DC converter (IC29). The +7 V power is passed through the KY-466 board and used to drive the green and red LEDs inside large switches on the KY-467 and KY-468 boards.

(3) External interface block
The external interface block communicates with a processor unit from the serial port (TXD0/RXD0) inside CPU via an RS-422 transceiver (IC24).

(4) Switch scan/LED lighting interface block
This block controls the data scanning of switches, volume controls, joysticks, and faders on the KY, VR, and LC boards and the lighting of LEDs on the LED board.
This block consists of 2 k-bit dual port memory (IC64), a dual port memory controller (IC70), parallel-to-serial converters (IC65 and IC66), a serial-to-parallel converter (IC68), and a buffer (IC67). The lighting on/off data of LEDs as well as the scan data of switches is memory-mapped on the dual port memory from CPU.
CPU writes the lighting on/off data of LEDs in the corresponding address of the dual port memory. The contents of the data are converted from parallel to serial (using IC65 and IC66) and sent to the KY-466 board together with a clock and other control signals.
The scan data by which various switches were multiplexed is loaded from the KY-466 board in serial and converted from serial to parallel (using IC68). The converted data is loaded to the dual port memory and read by CPU.

(5) Parallel interface block
Using a parallel interface circuit (IC72), this block drives the buzzer and operating indication LEDs, reads the DIP switch information, and controls the dual port memory controller. Moreover, it controls and displays the vacuum fluorescent display through IC62 and IC63.

2. KY-466 Board

The KY-466 board scans the data of switches, volume controls, faders, and joysticks and turns on the LED indicators and indication elements.
The LEDs decode the serial data and timing signal sent from the CPU-305 board and turn on them dynamically with a matrix of 8 × 8 as reference. The switches scan data by a matrix of 8 × 8. The pulse data of the volume controls (on the VR-263 an VR-264 boards) and faders is read using counter circuits (IC208 to IC210, and IC211 to IC214). The analog data of the joysticks (on the LC-40 board) is read using an A/D converter (IC215). After that, the read data is converted from parallel to serial together with switch scan data, and the multiplexed serial data is sent to the CPU-305 board.

3. Other Main Boards

The KY-467 board is used for numeric keys. The KY-468 board mounts crosspoint select switches, and CUT, AUTO, and TRANSITION switches. The main control circuit of these switches and LEDs on the board is located on the KY-466 board.

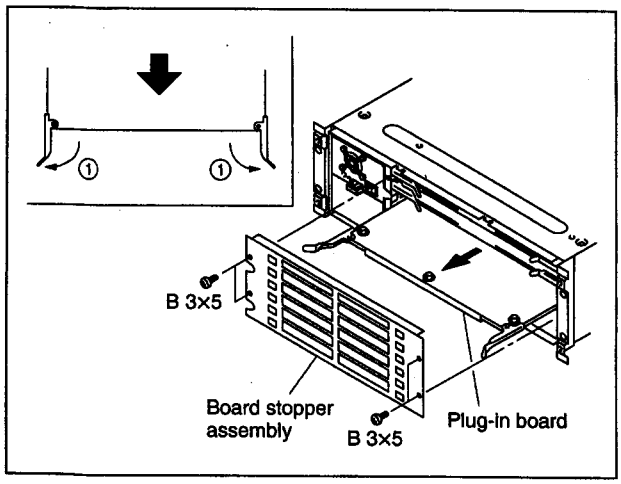
2-5. Replacement of Board

CAUTION

To avoid shock hazards and/or damage to the mounted circuit boards, be sure to turn off the power switch before inserting or pulling out the plug-in boards.

2-5-1. Replacement of Plug-in Board

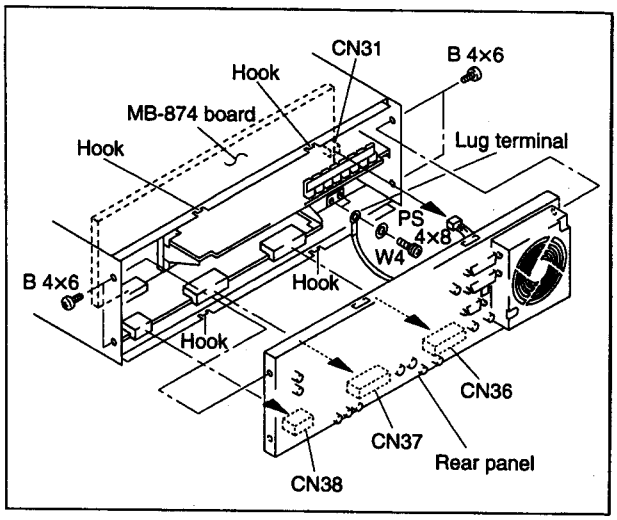
1. Remove the front panel. (Refer to Section 2-2.)
2. Remove the four screws and then remove the board stopper assembly.
3. Open the board levers in the direction of arrow ① and remove the plug-in board.



4. Install a new plug-in board in the reverse order of steps 1 to 3.

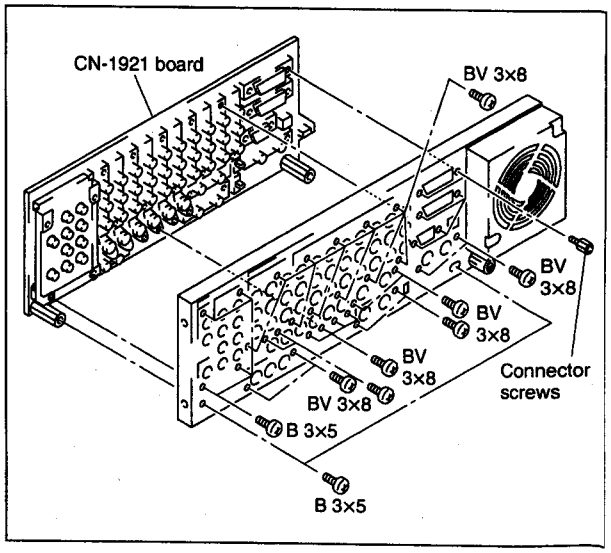
2-5-2. Replacement of Board

1. Remove the four screws (B4 × 6).
2. Disconnect the connectors (CN36, CN37, and CN38) on the CN-1921 board while removing the four hooks.
3. Remove the screw (PS4 × 8), washer (W4), and lug terminal and disconnect the connector (CN31) on the MB-874 board. Remove the rear panel.



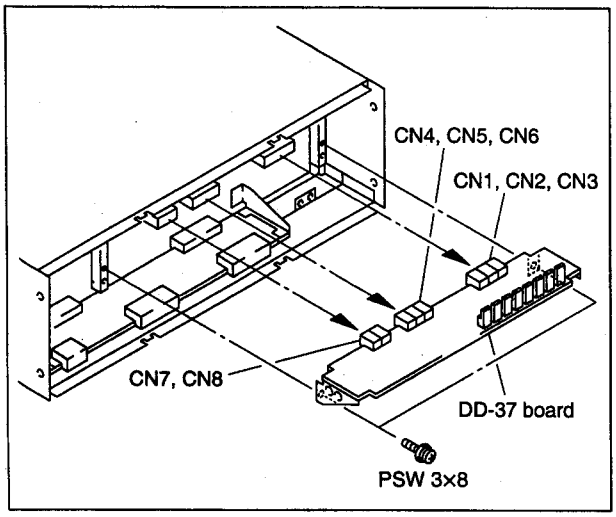
Replacing the CN-1921 board

1. Remove the 6 screws (B3 × 5) and 25 screws (BV3 × 8).
2. Remove the 6 connector screws and then remove the CN-1921 board.
3. Install a new CN-1921 board in the reverse order of steps 1 and 2.



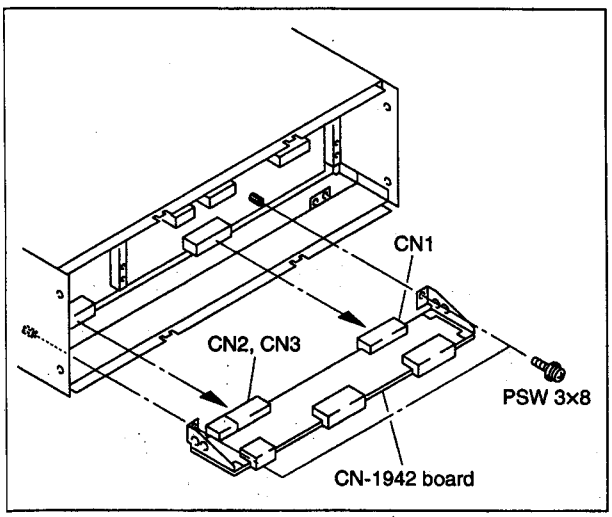
Replacement of DD-37 board

1. Remove the two screws.
2. Disconnect connectors (CN1 to CN8) on the DD-37 board and remove the DD-37 board.
3. Install a new DD-37 board in the reverse order of steps 1 and 2.



Replacement of CN-1942 board

1. Remove the two screws.
2. Disconnect the connectors (CN1 to CN3) on the CN-1942 board and remove the CN-1942 board.
3. Install a new CN-1942 board in the reverse order of steps 1 and 2.

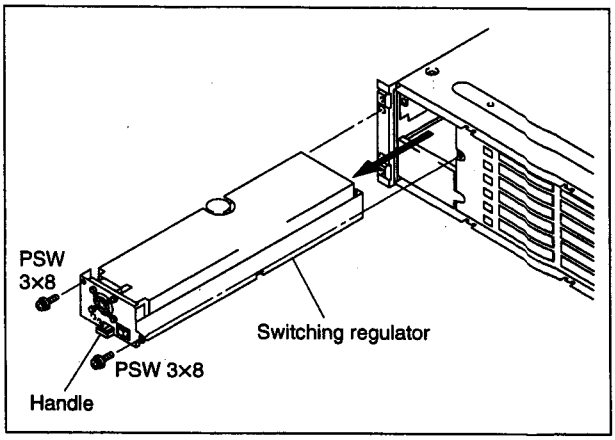


2-6. Replacement of Switching Regulator

WARNING

To avoid shock hazards and/or damage to the switching regulator, be sure to turn off the power switch before starting the replacement.

1. Remove the front panel. (Refer to Section 2-2.)
2. Remove the two screws and pull out the switching regulator while holding the handle.



3. Install a new switching regulator in the reverse order of steps 1 and 2.

CAUTION

Installing the power unit incompletely may cause an increase in the contact resistance of a connector and the part damage or smoking. Firmly tighten the screws fixing the power unit. Do not turn on the power until the power unit is fixed securely.

Note

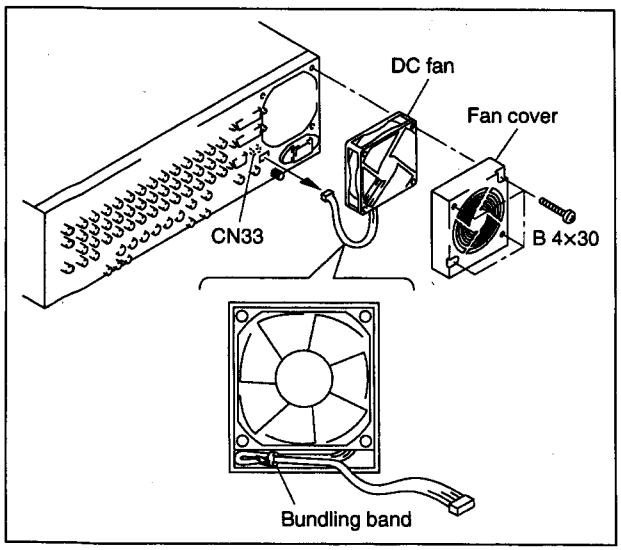
For the adjustment after the switching regulator replacement, refer to "4-7. Adjusting the Power Supply Voltage".

2-7. Replacement of DC Fan

WARNING

To avoid shock hazards and/or damage to the DC fan, be sure to turn off the power switch before inserting or pulling out the plug-in boards.

1. Remove the four screws and then remove the fan cover.
2. Disconnect the connector (CN33) on the CN-1921 board and remove the DC fan.



3. Install a new DC fan in the reverse order of steps 1 and 2.

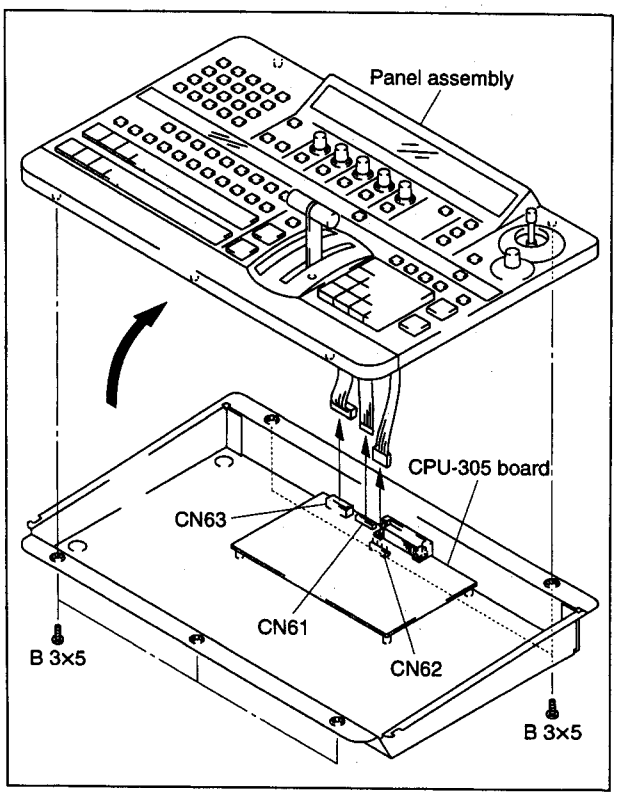
Notes

- As shown in the figure, fix the harness of the DC fan using a bundling band (available commercially).
- When installing the fan cover, take care not to interpose the harness at the bottom of the fan.

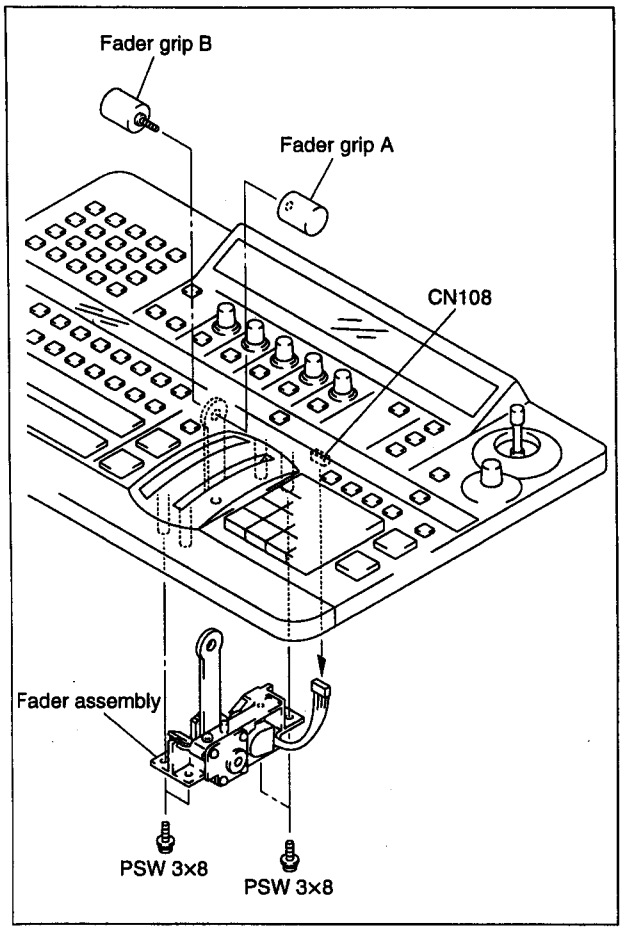
2-8. Replacement of Main Parts on Control Panel

2-8-1. Replacement of Fader Assembly

1. Remove the five screws and raise the panel assembly.
2. Disconnect the connectors (CN61 to CN63) on the CPU-305 board and remove the panel assembly.



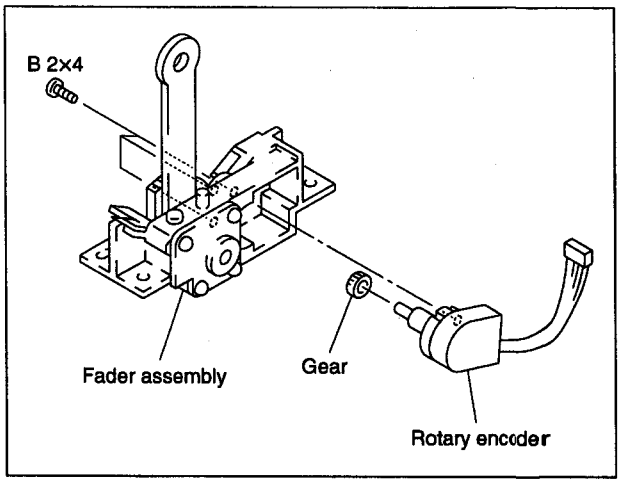
3. Remove the fader grips A and B.
4. Disconnect the connector (CN108) on the KY-466 board.
5. Remove the four screws and then remove the fader assembly.



6. Install a new fader assembly in the reverse order of steps 1 to 5.

2-8-2. Replacement of Rotary Encoder

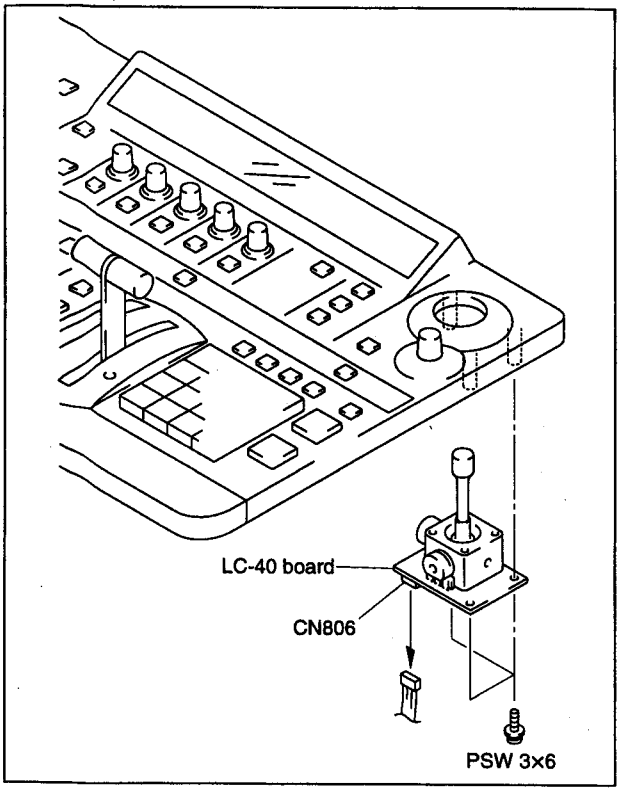
1. Remove the fader assembly. (Refer to Section 2-8-1.)
2. Remove the three screws, pull out the gear, and remove the rotary encoder.



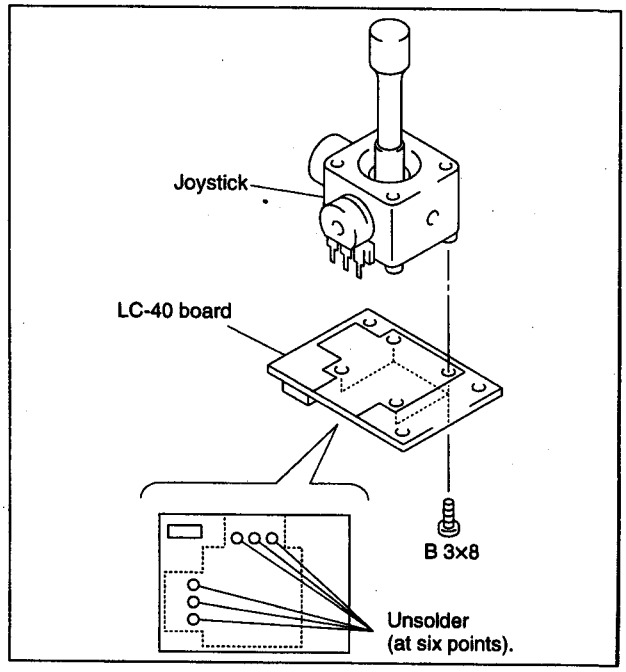
3. Install a new rotary encoder in the reverse order of steps 1 to 2.

2-8-3. Replacement of Joystick

1. Remove the panel assembly. (Refer to Section 2-8-1.)
2. Disconnect the connector (CN806) on the LC-40 board.
3. Remove the three screws and then remove the LC-40 board.



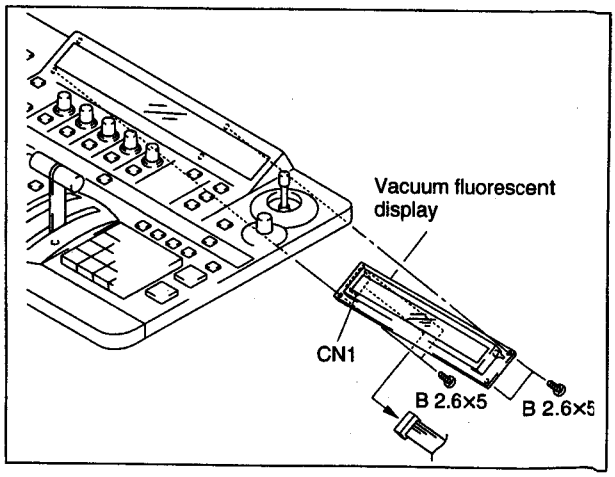
4. Remove the four screws on the LC-40 board.
5. Unsolder (at six points) on side B of the LC-40 board and remove the joystick.



6. Install a new joystick in the reverse order of steps 1 to5.

2-8-4. Replacement of Vacuum Fluorescent Display

1. Remove the panel assembly. (Refer to Section 2-8-1.)
2. Disconnect the connector (CN1) of the vacuum fluorescent display.
3. Remove the four screws and then remove the vacuum fluorescent display.



4. Install a new vacuum fluorescent display in the reverse order steps 1 to 3.

2-9. Fuse/IC Link Replacement

WARNING

A fuse and an IC link are an important component to safe operation.
Replace an old fuse and IC link with Sony parts described in this manual. If not, this may cause a fire or electric shock. Be sure to use the specified parts.

The boards for DFS-700/700P have fuses and IC links for circuit protection.
A fuse and an IC link blow when abnormality occurs in the equipment and an overcurrent flows or overheating occurs. Use the specified parts below. Eliminate the cause of fuse/IC link melting before replacing the parts.

DFS-700/700P

Board	Ref. No.	Parts name	Parts No.
DD-37	F1 (F-2)	Fuse, chip 10A/125V	⚠1-533-843-21
	F2 (E-2)	Fuse, chip 10A/125V	⚠1-533-843-21
	F3 (D-2)	Fuse, chip 10A/125V	⚠1-533-843-21
	F4 (D-2)	Fuse, chip 8 A/125V	⚠1-533-477-11
	F5 (A-2)	Fuse, chip 4 A/125V	⚠1-533-272-11
	F6 (A-2)	Fuse, chip 4 A/125V	⚠1-533-272-11
IPM-96/ IPM-96P	F1401 (M-2)	Fuse, chip 10 A/125 V	⚠1-576-329-11
	F1402 (M-5)	Fuse, chip 10 A/125 V	⚠1-576-329-11
	PS1403 (M-7)	Circuit Protector IC link 2 A	⚠1-533-282-21
	PS1404 (M-7)	Circuit Protector IC link 2 A	⚠1-533-282-21
OPM-39/ OPM-39P	F901 (M-1)	Fuse, chip 10 A/125 V	⚠1-576-329-11
	F902 (M-1)	Fuse, chip 10 A/125 V	⚠1-576-329-11
	F906 (M-2)	Fuse, chip 5 A/125 V	⚠1-533-627-21
	PS903 (M-2)	Circuit Protector IC link 2 A	⚠1-533-282-21
	PS904 (K-1)	Circuit Protector IC link 2 A	⚠1-533-282-21
	PS905 (K-2)	Circuit Protector IC link 2 A	⚠1-533-282-21
VSW-69/ VSW-69P	F1 (B-1)	Fuse, chip 10 A/125 V	⚠1-576-329-11
	F2 (F-1)	Fuse, chip 10 A/125 V	⚠1-576-329-11

The fuse/IC link location on the board is shown in parentheses.

BKDF-701

Board	Ref. No.	Parts name	Parts No.
VIF-20/ VIF-20P	F1401 (M-2)	Fuse, chip 10 A/125 V	⚠1-576-329-11
	F1402 (M-5)	Fuse, chip 10 A/125 V	⚠1-576-329-11
	PS1403 (M-7)	Circuit Protector IC link 2 A	⚠1-533-282-21
	PS1404 (M-7)	Circuit Protector IC link 2 A	⚠1-533-282-21

The fuse/IC link location on the board is shown in parentheses.

BKDF-702/702P

Board	Ref. No.	Parts name	Parts No.
VIF-19/ VIF-19P	F1701 (K-1)	IC link 10 A (CHIP)	⚠1-576-329-11
	PS1703 (K-9)	Circuit Protector IC link 2 A	⚠1-533-282-21
	PS1704 (K-8)	Circuit Protector IC link 2 A	⚠1-533-282-21
	PS1705 (K-9)	Circuit Protector IC link 2 A	⚠1-533-282-21

The fuse/IC link location on the board is shown in parentheses.

BKDF-711

Board	Ref. No.	Parts name	Parts No.
CMB-12	F1 (A-2)	Fuse, chip 10 A/125 V	⚠1-576-329-11
	PS2 (A-1)	Circuit Protector IC link 0.8 A	⚠1-576-123-21

The fuse/IC link location on the board is shown in parentheses.

BKDF-712

Board	Ref. No.	Parts name	Parts No.
VSE-36	PS1 (B-2)	Circuit Protector IC link 2 A	⚠1-533-282-21
	PS2 (B-2)	Circuit Protector IC link 2 A	⚠1-533-282-21

The fuse/IC link location on the board is shown in parentheses.

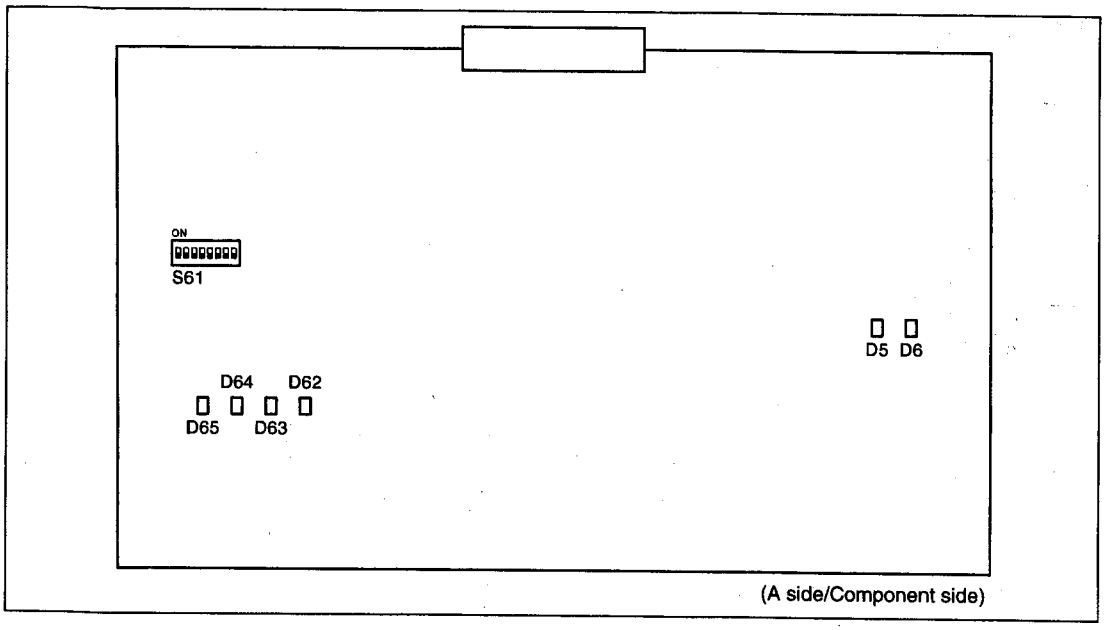
2-10. Switch, Indicators, and Volume Controls on Board

Note

The parts location on the board is shown in parentheses.

2-10-1. Control Panel

CPU-305 Board



Switch

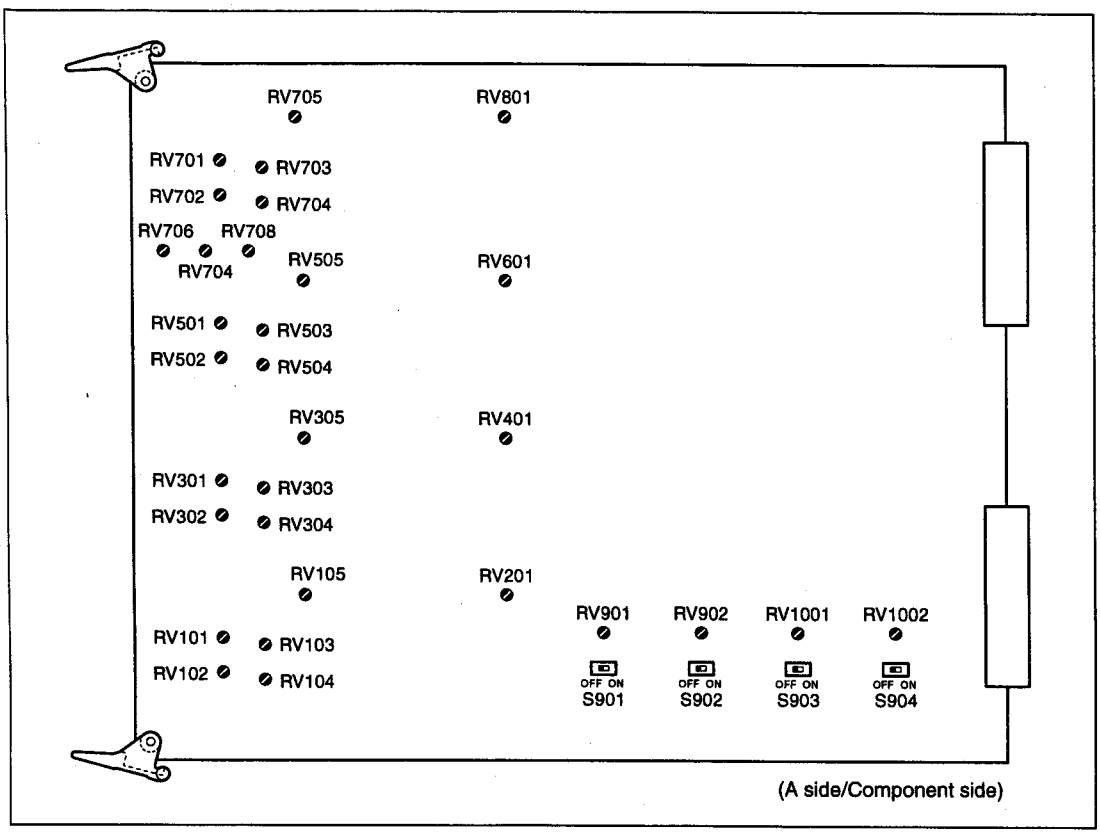
Ref.No.	Name	Description
S61 (C-1)	Setting switches for operation	The factory setting is set to the all OFF positions. Other settings are used for design or manufacturing.

Indicators

Ref.No.	Name	Description
D5 (B-6)	+5 V	Green: When a voltage of +5 V is output from IC29. (DC-DC Converter) Off: When a voltage of +5 V is not output from IC29. (DC-DC Converter)
D6 (B-7)	+7 V	Green: When a voltage of +7 V is output from IC29. (DC-DC Converter) Off: When a voltage of +7 V is not output from IC29. (DC-DC Converter)
D62 (B-2)	—	Unused.
D63 (B-2)		Blinks slowly at intervals of about one second: The CPU and software operate normally. Lights or off: The CPU, its peripheral circuit, or software is defective.
D64 (B-1)		Blinks: The internal V period timer of CPU and software is normal. Lights or off: The CPU, its peripheral circuit, or software is defective. **Note** The V period timer operates even if a sync signal is not input from the processor unit.
D65 (B-1)		Blinks: An external V sync signal is input. Lights or off: No signal is input or a proper signal is not input.

2-10-2. Processor

1. IPM-96/96P Board



Switches (Factory default settings are indicated by ■ mark.)

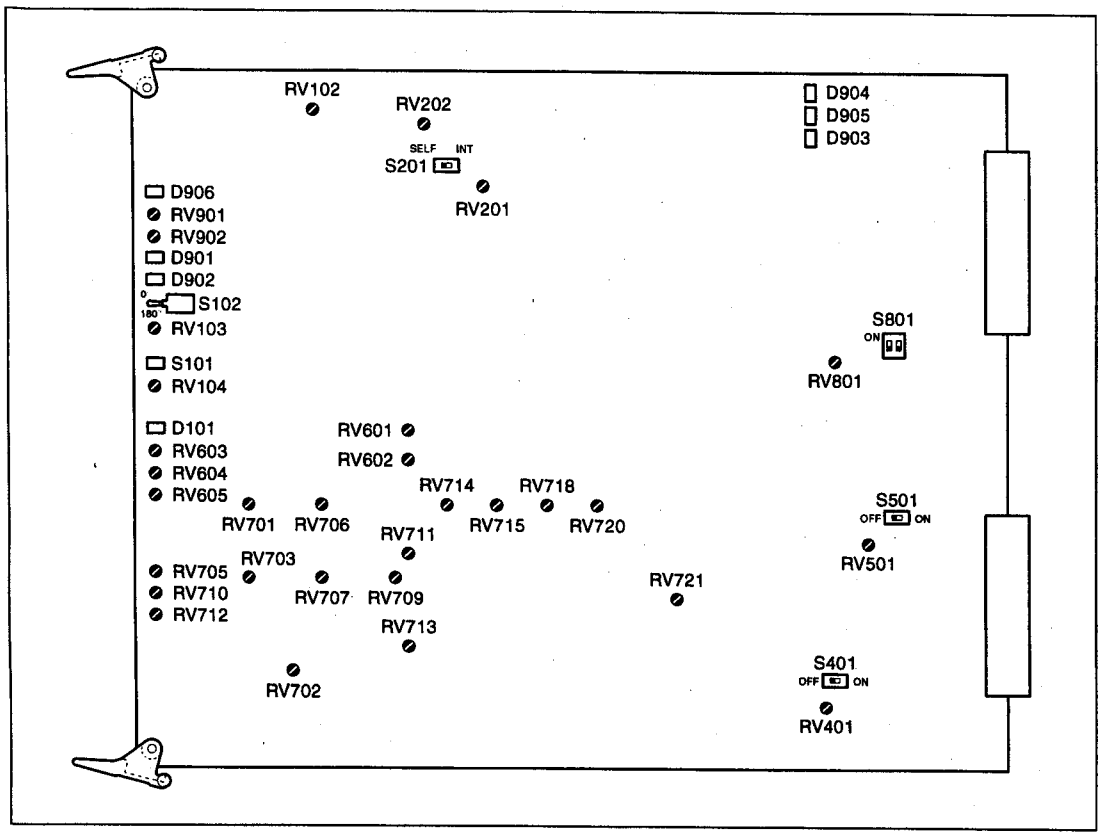
Ref.No.	Name	Function
S901 (G-9)	SDI IN 1 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation
S904 (J-9)	SDI IN 2 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation
S1001(K-9)	SDI IN 3 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation
S1002(L-9)	SDI IN 4 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation

Volume controls

Ref.No	Function
RV101 (B-9)	Used for 5/1CH input Y/R-Y delay adjustment
RV102 (B-9)	Used for 5/1CH input Y/B-Y delay adjustment
RV103 (B-9)	Used for 5/1CH input component R-Y chroma level adjustment
RV104 (B-9)	Used for 5/1CH input component B-Y chroma level adjustment
RV105 (C-8)	Used for 5/1CH input component Y level adjustment
RV201 (F-8)	Used for 5/1CH input video phase adjustment
RV301 (B-7)	Used for 6/2CH Y/R-Y delay adjustment

Ref.No	Function
RV302 (B-7)	Used for 6/2CH Y/B-Y delay adjustment
RV303 (B-7)	Used for 6/2CH input component R-Y chroma level adjustment
RV304 (B-7)	Used for 6/2CH input component B-Y chroma level adjustment
RV305 (C-6)	Used for 6/2CH input component Y level adjustment
RV401 (F-6)	Used for 6/2CH input video phase adjustment
RV501 (B-4)	Used for 7/3CH Y/R-Y delay adjustment
RV502 (B-5)	Used for 7/3CH Y/B-Y delay adjustment
RV503 (B-4)	Used for 7/3CH input component R-Y chroma level adjustment
RV504 (B-5)	Used for 7/3CH input component B-Y chroma level adjustment
RV505 (C-4)	Used for 7/3CH input component Y level adjustment
RV601 (F-4)	Used for 7/3CH input video phase adjustment
RV701 (B-2)	Used for 8/4CH Y/R-Y delay adjustment
RV702 (B-2)	Used for 8/4CH Y/B-Y delay adjustment
RV703 (B-2)	Used for 8/4CH input component R-Y chroma level adjustment
RV704 (B-2)	Used for 8/4CH input component B-Y chroma level adjustment
RV705 (C-1)	Used for 8/4CH input component Y level adjustment
RV706 (A-3)	RGB input Y level adjustment
RV707 (A-3)	RGB input R-Y chroma level adjustment
RV708 (B-3)	RGB input B-Y chroma level adjustment
RV801 (F-1)	Used for 8/4CH input video phase adjustment
RV901 (G-9)	Used for SDI input 1 VCO free-running adjustment
RV902 (J-9)	Used for SDI input 2 VCO free-running adjustment
RV1001 (K-9)	Used for SDI input 3 VCO free-running adjustment
RV1002 (L-9)	Used for SDI input 4 VCO free-running adjustment

2. OPM-39/39P Board



Switches (Factory default settings are indicated by ■ mark.)

Ref.No.	Name	Function
S101 (A-5)	GEN.LOCK H PHASE COARSE	Adjusts the GEN.LOCK H phase during external synchronization. ■ Factory default settings: 8
 (Factory default setting)		
S102 (A-4)	GEN.LOCK SC PHASE COARSE	Inverts the GEN.LOCK SC phase (by 180 degrees) during external synchronization. ■ 0°: Under normal operation 180°: When inverting the GEN.LOCK SC phase by 180 degrees during external synchronization
S201 (E-2)	EXT DSK KEY CLAMP SEL	Selects the pulse that clamps an EXT DSK input signal. ■ SELF: Uses the clamp pulse generated from the sync signal of an input signal. INT: Uses the clamp pulse generated from a sync generator. **Note** Usually, do not change the setting.
S401 (K-9)	PGM OUT (SDI) VCO FREE RUN	ON: PGM OUT (SDI) turns to the VCO free-running state. ■ OFF: Under normal operation

Ref.No.	Name	Function
S501 (L-7)	CLEAN OUT (SDI) VCO FREE RUN	ON: CLEAN OUT (SDI) turns to the VCO free-running state. ■ OFF: Under normal operation
S801 (L-4)	SET UP	Switches NTSC J and NTSC UC according to the destination. **Note** Do not change the setting because it has been fixed according to the destination.

Indicators

Ref.No.	Name	Function
D101 (A-6)	GEN LOCK	Displays an external input sync signal turns to the REF. VIDEO input terminal on the rear panel. Amber: An external sync signal is input. The system is synchronized with the external sync signal automatically. Off: No external sync signal is input. The system is synchronized with an internal sync signal automatically.
D901 (A-3)	+5 V DC	Displays the input state of a +5 V power supply. Green: A power supply of +5 V is supplied. (Fuse F901 does not burn out.) Off: A power supply of +5 V is not supplied.
D902 (A-4)	+3.3 V DC	Displays the input state of a +3.3 V power supply. Green: A power supply of +3.3 V is supplied. (Fuse F902 does not burn out.) Off: A power supply of +3.3 V is not supplied.
D903 (K-2)	+5 V (A) DC	Displays the input state of a +7 V power from which a power line of +5 V(A) is supplied. Green: A power supply of +7 V is supplied. (IC link PS903 does not burn out.) Off: A power supply of +7 V is not supplied.
D904 (K-1)	−5 V DC	Displays the input state of a −7 V power from which a power line of −5 V(A) is supplied. Green: A power supply of −7 V is supplied. (IC link PS904 does not burn out.) Off: A power supply of −7 V is not supplied.
D905 (K-1)	+9 V DC	Displays the input state of a +12 V power from which a power line of +9 V is supplied. Green: A power supply of +12 V is supplied. (IC link PS905 does not burn out.) Off: A power supply of +12 V is not supplied.
D906 (A-2)	PANEL +12 V DC	Displays the input state a +12 V power that is input to the control panel. Green: A power supply of +12 V is supplied. (Fuse F906 does not burn out.) Off: A power supply of +12 V is not supplied.

Volume controls

Ref.No	Function
RV101 (D-4)	Used for the SC frequency adjustment during internal oscillation
RV102 (C-1)	Used for the SCH phase adjustment during internal oscillation
RV103 (A-4)	Used for the GEN.LOCK SC phase adjustment during external synchronization
RV104 (A-5)	Used for the GEN.LOCK H phase adjustment during external synchronization

(Continued)

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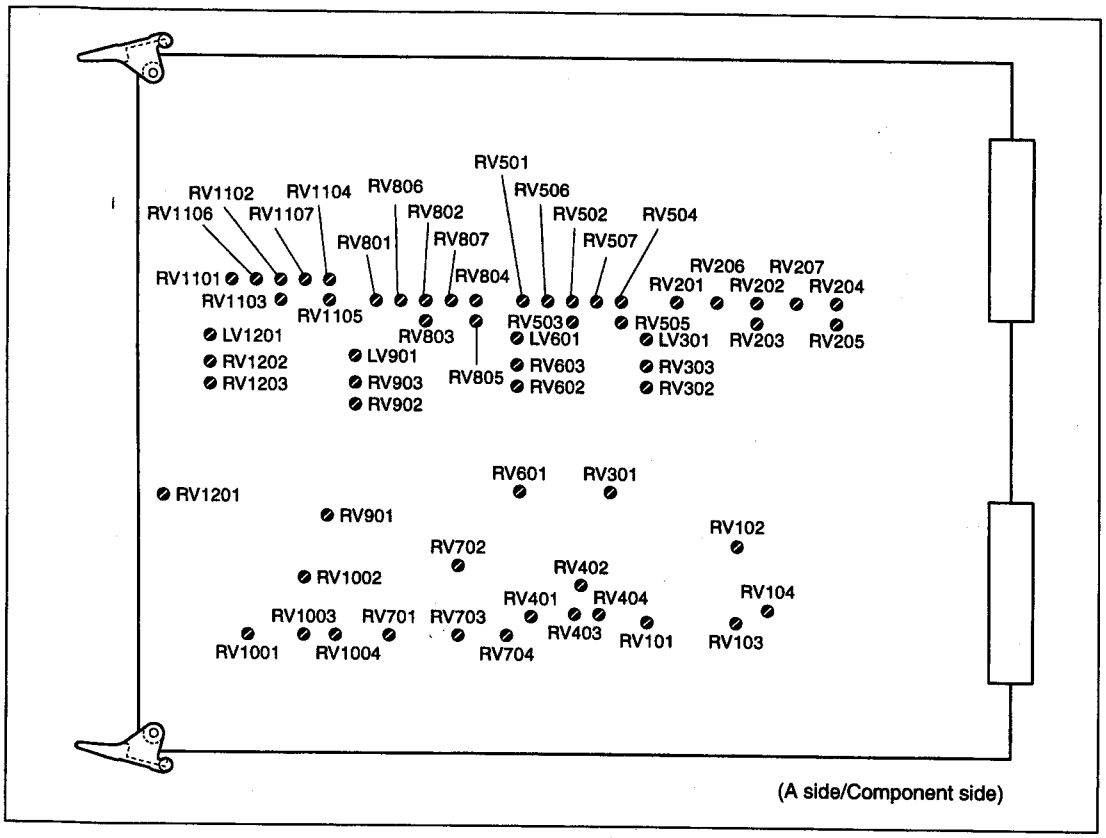
Ref.No	Function
RV105 (B-4)	Used for the SCH phase adjustment of a black burst output signal during internal oscillation
RV106 (B-3)	Used for the SCH phase adjustment during PGM OUT (Y/C and composite) pre-reading (PAL only)
RV107 (C-1)	Used for the burst flag position adjustment during PGM OUT (Y/C and composite) pre-reading (PAL only)
RV201 (E-2)	Used for EXT.DSK KEY gain adjustment
RV202 (E-2)	Used for EXT.DSK KEY clamp level adjustment
RV401 (K-9)	Used for PGM OUT (SDI) VCO free-running frequency adjustment Set switch S401 (K-9) to ON during adjustment and set it to OFF after adjustment
RV501 (L-7)	Used for CLEAN OUT (SDI) free-running frequency adjustment Set switch S501 (L-7) to ON during adjustment and set it to OFF after adjustment
RV601 (D-6)	Used for PGM OUT (COMPONENT) Y signal and R-Y signal delay adjustment
RV602 (D-6)	Used for PGM OUT (COMPONENT) Y signal and B-Y signal delay adjustment
RV603 (A-6)	Used for PGM OUT (COMPONENT) Y signal gain adjustment
RV604 (A-6)	Used for PGM OUT (COMPONENT) R-Y signal gain adjustment
RV605 (A-7)	Used for PGM OUT (COMPONENT) B-Y signal gain adjustment
RV701 (B-7)	Used for PGM OUT (COMPONENT, Y/C, COMPOSITE) SYNC level adjustment
RV702 (C-9)	Used for PGM OUT (COMPOSITE) C signal level adjustment
RV703 (B-8)	Used for PGM OUT (COMPOSITE) SC leak (R-Y signal) balance adjustment
RV704 (C-9)	Used for PGM OUT (COMPOSITE) burst AXIS adjustment (PAL only)
RV705 (A-8)	Used for PGM OUT (COMPOSITE) gain adjustment
RV706 (C-7)	Used for the PGM OUT (COMPOSITE and C of Y/C) burst level adjustment
RV707 (C-8)	Used for the gain adjustment of a PGM OUT (COMPOSITE) C signal V axis
RV709 (D-8)	Used for PGM OUT (COMPOSITE) SC leak (B-Y signal) balance adjustment
RV710 (A-8)	Used for PGM OUT (Y/C) Y signal gain adjustment
RV711 (D-8)	Used for the angle adjustment of a PGM OUT (COMPOSITE and Y/C) chroma-orthogonal modulation axis
RV712 (A-8)	Used for PGM OUT (Y/C) C signal gain adjustment
RV713 (D-9)	Used for PGM OUT (COMPOSITE) Y/C delay adjustment
RV714 (E-7)	Used for BLACK BURST OUT sync level adjustment
RV715 (E-7)	Used for BLACK BURST OUT burst level adjustment
RV717 (F-7)	Used for BLACK BURST OUT AXIS adjustment (PAL only)
RV718 (F-7)	Used for BLACK BURST OUT SC leak (V) balance adjustment
RV720 (G-7)	Used for BLACK BURST OUT SC leak (U) balance adjustment
RV721 (H-8)	Used for the SC phase adjustment to the PGM output signal of a black burst output signal
RV801 (K-4)	Used for PVW OUT (COMPOSITE) gain adjustment
RV901 (A-3)	Used for the voltage adjustment of +5 V DC Connect a tester to TP901 (+5 V) and TP903 (GND) and check the voltage
RV902 (A-3)	Used for the voltage adjustment of +3.3 V DC Connect a tester to TP902 (+3.3 V) and TP903 (GND) and check the voltage

3. VIF-19/19P Board



Volume controls

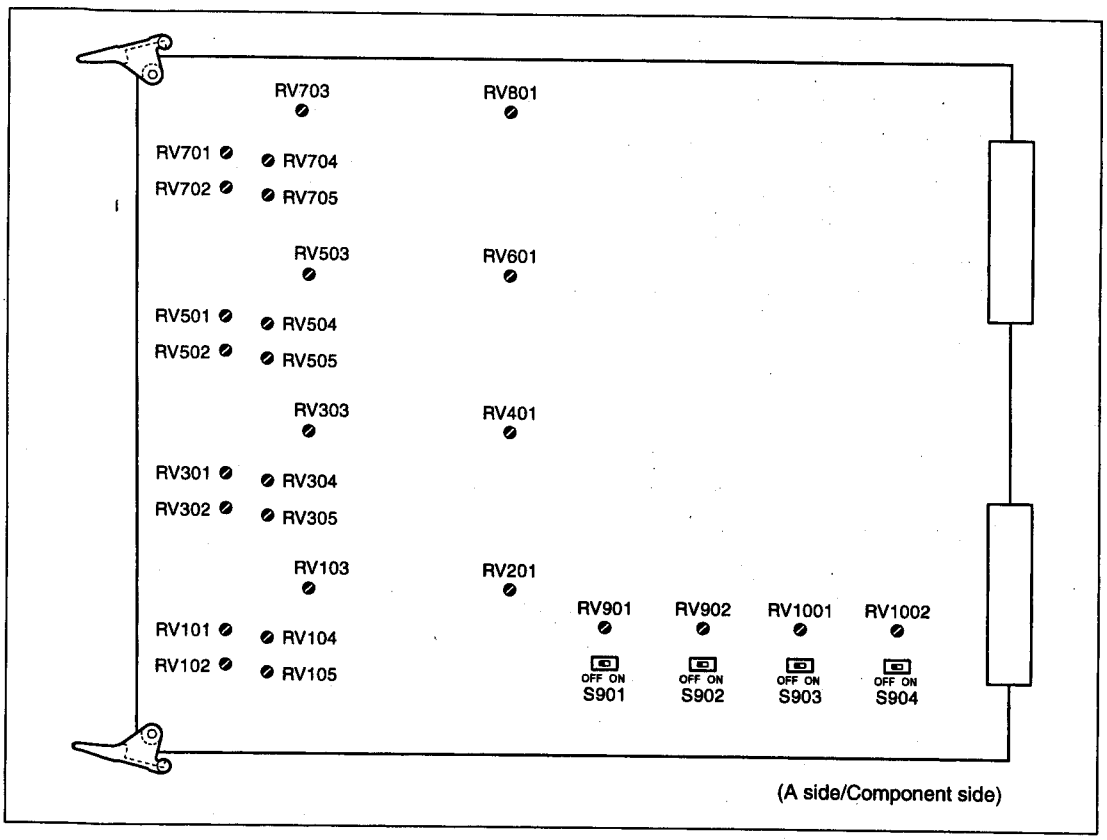
Ref.No	Function
LV301 (H-4)	Used for CH5 VFO BIAS adjustment
LV601 (F-4)	Used for CH6 VFO BIAS adjustment
LV901 (D-4)	Used for CH7 VFO BIAS adjustment
LV1201 (A-4)	Used for CH8 VFO BIAS adjustment
RV101 (H-9)	Used for CH5 burst delay adjustment
RV102 (J-8)	Used for CH5 composite Y level adjustment
RV103 (J-9)	Used for CH5 Y gain adjustment (during S video input)
RV104 (J-9)	Used for CH5 clamp DC adjustment
RV201 (H-4)	Used for CH5 Y gain adjustment (during composite input)
RV202 (J-4)	Used for CH5 Y/B-Y DL adjustment (during S video input)
RV203 (J-4)	Used for CH5 Y/B-Y DL adjustment (during composite input)
RV204 (J-4)	Used for CH5 Y/R-Y DL adjustment (during S video input)
RV205 (J-4)	Used for CH5 Y/R-Y DL adjustment (during composite input)
RV206 (H-4)	Used for CH5 B-Y level adjustment
RV207 (J-4)	Used for CH5 R-Y level adjustment
RV301 (G-7)	Used for CH5 sync separate adjustment
RV302 (H-5)	Used for CH5 SAWTOOTH slope adjustment
RV303 (H-5)	Used for CH5 sampling pulse phase adjustment and input video phase adjustment

(Continued)

(Continued)

Ref.No	Function
RV401 (F-9)	Used for CH6 burst delay adjustment
RV402 (G-8)	Used for CH6 composite Y level adjustment
RV403 (G-9)	Used for CH6 Y gain adjustment (during S video input)
RV404 (G-9)	Used for CH6 clamp DC adjustment
RV501 (F-4)	Used for CH6 Y gain adjustment (during composite input)
RV502 (G-4)	Used for CH6 Y/B-Y DL adjustment (during S video input)
RV503 (G-4)	Used for CH6 Y/B-Y DL adjustment (during composite input)
RV504 (G-4)	Used for CH6 Y/R-Y DL adjustment (during S video input)
RV505 (G-4)	Used for CH6 Y/R-Y DL adjustment (during composite input)
RV506 (F-4)	Used for CH6 B-Y level adjustment
RV507 (G-4)	Used for CH6 R-Y level adjustment
RV601 (E-7)	Used for CH6 sync separate adjustment
RV602 (F-5)	Used for CH6 SAWTOOTH slope adjustment
RV603 (F-5)	Used for CH6 sampling pulse phase adjustment and input video phase adjustment
RV701 (D-9)	Used for CH7 burst delay adjustment
RV702 (E-8)	Used for CH7 composite Y level adjustment
RV703 (E-9)	Used for CH7 Y gain adjustment (during S video input)
RV704 (E-9)	Used for CH7 clamp DC adjustment
RV801 (D-4)	Used for CH7 Y gain adjustment (during composite input)
RV802 (D-4)	Used for CH7 Y/B-Y DL adjustment (during S video input)
RV803 (D-4)	Used for CH7 Y/B-Y DL adjustment (during composite input)
RV804 (E-4)	Used for CH7 Y/R-Y DL adjustment (during S video input)
RV805 (E-4)	Used for CH7 Y/R-Y DL adjustment (during composite input)
RV806 (D-4)	Used for CH7 B-Y level adjustment
RV807 (E-4)	Used for CH7 R-Y level adjustment
RV901 (C-7)	Used for CH7 sync separate adjustment
RV902 (D-5)	Used for CH7 SAWTOOTH slope adjustment
RV903 (D-5)	Used for CH7 sampling pulse phase adjustment and input video phase adjustment
RV1001 (B-9)	Used for CH8 burst delay adjustment
RV1002 (B-8)	Used for CH8 composite Y level adjustment
RV1003 (C-9)	Used for CH8 Y gain adjustment (during S video input)
RV1004 (C-9)	Used for CH8 clamp DC adjustment
RV1101 (B-4)	Used for CH8 Y gain adjustment (during composite input)
RV1102 (B-4)	Used for CH8 Y/B-Y DL adjustment (during S video input)
RV1103 (B-4)	Used for CH8 Y/B-Y DL adjustment (during composite input)
RV1104 (C-4)	Used for CH8 Y/R-Y DL adjustment (during S video input)
RV1105 (C-4)	Used for CH8 Y/R-Y DL adjustment (during composite input)
RV1106 (B-4)	Used for CH8 B-Y level adjustment
RV1107 (C-4)	Used for CH8 R-Y level adjustment
RV1201 (A-7)	Used for CH8 sync separate adjustment
RV1202 (B-5)	Used for CH8 SAWTOOTH slope adjustment
RV1203 (A-5)	Used for CH8 sampling pulse phase adjustment and input video phase adjustment

4. VIF-20/20P Board



Switches (Factory default settings are indicated by ■ mark.)

Ref.No.	Name	Function
S901 (G-9)	SDI IN 5 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation
S904 (J-9)	SDI IN 6 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation
S1001 (K-9)	SDI IN 7 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation
S1002 (L-9)	SDI IN 8 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation

Volume controls

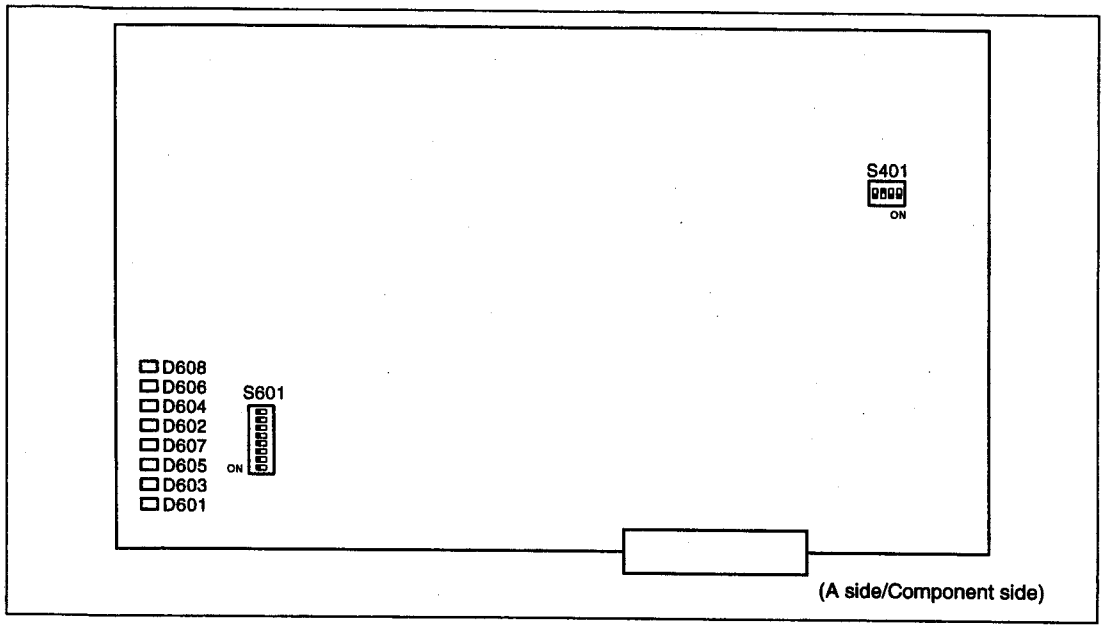
Ref.No	Function
RV101 (B-9)	Used for 5CH Y/R-Y delay adjustment
RV102 (B-9)	Used for 5CH Y/B-Y delay adjustment
RV103 (C-8)	Used for 5CH input component Y level adjustment
RV104 (B-9)	Used for 5CH input component R-Y chroma level adjustment
RV105 (B-10)	Used for 5CH input component B-Y chroma level adjustment
RV201 (F-8)	Used for 5CH input video phase adjustment
RV301 (B-7)	Used for 6CH Y/R-Y delay adjustment
RV302 (B-7)	Used for 6CH Y/B-Y delay adjustment

(Continued)

(Continued)

Ref.No	Function
RV303 (C-6)	Used for 6CH input component Y level adjustment
RV304 (B-7)	Used for 6CH component R-Y chroma level adjustment
RV305 (B-7)	Used for 6CH input component B-Y chroma level adjustment
RV401 (F-6)	Used for 6CH input video phase adjustment
RV501 (B-4)	Used for 7CH Y/R-Y delay adjustment
RV502 (B-5)	Used for 7CH Y/B-Y delay adjustment
RV503 (C-4)	Used for 7CH input component Y level adjustment
RV504 (B-4)	Used for 7CH component R-Y chroma level adjustment
RV505 (B-5)	Used for 7CH input component B-Y chroma level adjustment
RV601 (F-4)	Used for 7CH input video phase adjustment
RV701 (B-2)	Used for 8CH Y/R-Y delay adjustment
RV702 (B-3)	Used for 8CH Y/B-Y delay adjustment
RV703 (C-1)	Used for 8CH input component Y level adjustment
RV704 (B-2)	Used for 8CH component R-Y chroma level adjustment
RV705 (B-3)	Used for 8CH input component B-Y chroma level adjustment
RV801 (F-1)	Used for 8CH input video phase adjustment
RV901 (G-9)	Used for SDI input 5 VCO free-running adjustment
RV902 (J-9)	Used for SDI input 6 VCO free-running adjustment
RV1001 (K-9)	Used for SDI input 7 VCO free-running adjustment
RV1002(L-9)	Used for SDI input 8 VCO free-running adjustment

5. VSE-36 Board



Switches (Factory default settings are indicated by ■ mark.

Ref.No.	Name	Function
S401 (K-4) ON (Factory default setting)	Timing control switch	Sets the operation timing of address memory. **Note** Do not change the setting of switch S401 because it has been set to the optimum value at the factory.
S601 (B-7)	Main CPU control switch	Controls the address CPU operation. **Note** Set switch S601 to all ON during normal operation. Never set S601-1 and S601-3 to OFF. This may cause a system malfunction.
bit-1		Switches the main program to be activated. ■ ON: Activated from IC602. The system is not activated when this bit is set to OFF.
bit-2		Switches the serial port. ■ ON: Uses debugging terminal connection port (CN12). OFF: Uses no debugging terminal connection port (CN12).
bit-3		Specifies the source from which a copy command (debugging terminal) is copied. ■ ON: IC617 (Flash memory socket) The system is not activated when this bit is set to OFF.
bit-4		Executes the main program during boot up. ■ ON: Executes the main program. OFF: Executes no main program. (Executes only a start-up program.)
bit-5		Sets the communication rate of a debugging terminal. ■ ON: 38.4 Kbps OFF: 115.2 Kbps

(Continued)

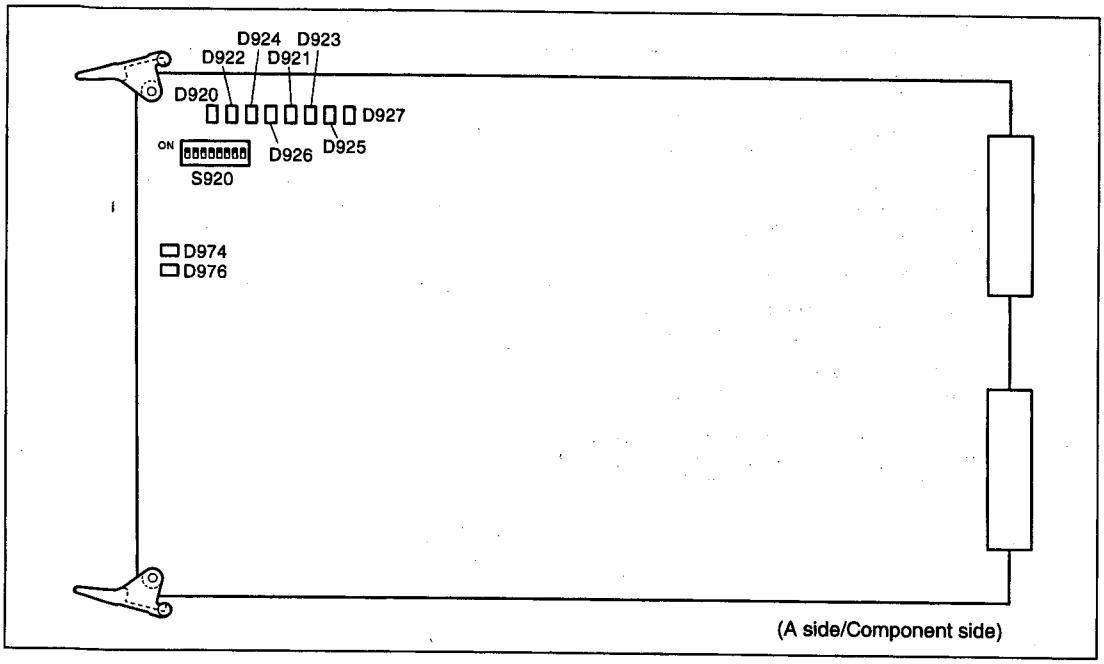
(Continued)

Ref.No.	Name	Function
	bit-6	Confirms the checksum of a main program during boot up. ■ ON: Confirms the checksum. OFF: Confirms no checksum.
	bit-7	Not used
	bit-8	Not used

Indicators

Ref.No.	Function
D601 (A-7)	Blinks during address CPU operation.
D602 (A-6)	Blinks during address CPU operation.
D603 (A-7)	Blinks during address CPU operation.
D604 (A-6)	Blinks during address CPU operation.
D605 (A-7)	Blinks during address CPU operation.
D606 (A-6)	Blinks during address CPU operation.
D607 (A-6)	Blinks during address CPU operation.
D608 (A-6)	Blinks during address CPU operation.
D705 (F-7)	Lights: A power supply of +3 V is normal Off: A power supply of +3 V is abnormal
D707 (E-7)	Lights: A power supply of +5 V is normal Off: A power supply of +5 V is abnormal

7. VSW-69/69P Board



Switches (Factory default settings are indicated by ■ mark.)

Ref.No.	Name	Function
S920 (B-14)	Main CPU control switch	Controls the main CPU operation. **Note** Set switch S920 to all ON during normal operation. Never set S920-1 and S920-3 to OFF. This may cause a system malfunction.
	bit-1	Switches the main program to be activated. ■ ON: Activated from IC920. The system is not activated when this bit is set to OFF.
	bit-2	Switches the serial port. ■ ON: Used as an editor interface. OFF: Used as a debugging terminal connection port (CN12).
	bit-3	Specifies the source from which a copy command (debugging terminal) is copied. ■ ON: IC958 (Flash memory socket) The system is not activated when this bit is set to OFF.
	bit-4	Executes the main program during boot up. ■ ON: Executes the main program. OFF: Executes no main program. (Executes only a start-up program.)
	bit-5	Sets the communication rate of a debugging terminal. ■ ON: 38.4 Kbps OFF: 115.2 Kbps
	bit-6	Confirms the checksum of the main program during boot up. ■ ON: Confirms the checksum. OFF: Confirms no checksum.
	bit-7	Not used
	bit-8	Returns the set value to the factory setting during boot up. ■ ON: Under normal operation OFF: Returns to the factory setting.

Indicators

Ref.No.	Function
D920 (A-14)	Blinks during main CPU operation.
D921 (A-13)	Blinks during main CPU operation.
D924 (A-13)	Blinks during main CPU operation.
D924 (A-13)	Blinks during main CPU operation.
D925 (A-12)	Blinks during main CPU operation.
D926 (A-13)	Blinks during main CPU operation.
D927 (A-12)	Lights: PAL (VSW-69P is installed) Off: NTSC (VSW-69 is installed)
D974 (E-15)	Lights: A power supply of +3 V is normal Off: A power supply of +3 V is abnormal
D975 (E-15)	Lights: A power supply of +5 V is normal Off: A power supply of +5 V is abnormal

2-11. Error Indication

Error indication blinks on the menu display if some failure occurs during power-on sequence or normal operation.
To clear the error indication, press the F5 (OK) button.
If multiple errors exist, an error with higher priority is displayed first.
After the error indication with higher priority is cleared using the F5 (OK) button, an error with lower priority is displayed.
The remedy when an error occurred are described below.

No.	Error indication	Contents of error	Remedy
011	"011 FAN STOP!! " ->Turn OFF Power OK "	The processor detects that the power fan stopped.	Turn off the power and confirm that the power harness of a DC fan is not disconnected and connected properly. If no failure is found, replace the DC fan.
012	"012 Power Unit Error " " ->Turn OFF Power OK "	The power supply has a trouble.	Turn off the power and check the block around the power supply.
021	"021 Reference Signal Error " " -> OK "	A V sync signal is not properly sent from the processor to the control panel.	Confirm the cable connection.
022	"022 Self Diagnostic Error. (XXXX/XXXX) " " ->Check on Maintenance menu OK " An error status is displayed in the (XXXX/XXXX) section. The status of the VSW-69/69P board is displayed before "/", and that of the VSE-36 board after "/". 0000: Normal 0001: Memory error	Failure is detected during self-diagnosis.	Replace the VSW-69/69P or VSE-36 board.
023	"023 Software Version Mismach " " ->Load the latest S/W OK "	The software versions of the processor and control panel are different.	Install the software.
031	"031 Data Backup Error. (XX) " " -> OK " An error status is displayed in the (XX) section. 01: User program 02: Snapshot 04: Direct pattern 08: Resume 10: Setup If multiple errors occurred, the value obtained when they were added is displayed.	The information on a user program and setup is not properly written in backup memory.	Replace the VSW-69/69P board.

2-12. Periodic Inspection

2-12-1. Periodic Replacement Parts

To keep the performance of this unit, inspect the parts below periodically and clean or replace them.

Parts	Cleaning period	Replacement period	Parts No.
Filter	Two months	Five years	3-625-956-01
Fan	One month	Three years	1-698-080-11

For more details of cleaning, refer to Section 2-12-2.
For the fan replacement, refer to Section 2-7.

2-12-2. Filter Cleaning

WARNING

Before starting the cleaning, be sure to turn off the power switch and pull out the power plug.

CAUTION

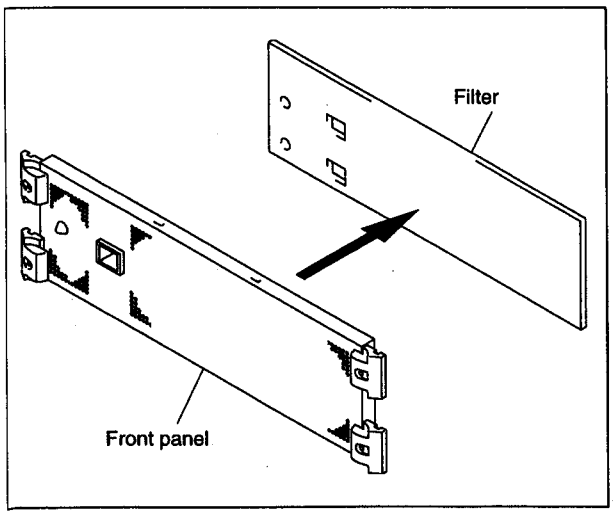
Do not block the ventilating hole with the dust on a filter. This causes an increase in temperature inside this unit. In this case, do not touch the inside of this unit. This may cause a burn.

Clean the Filter Periodically (every two months).

1. Remove the front panel. (Refer to Section 2-2.)
2. Absorb the dust on the filter using a vacuum cleaner.

   Note

   It is recommended to wash it when dust excessively adheres to the filter. However, dry it fully after washing the filter.



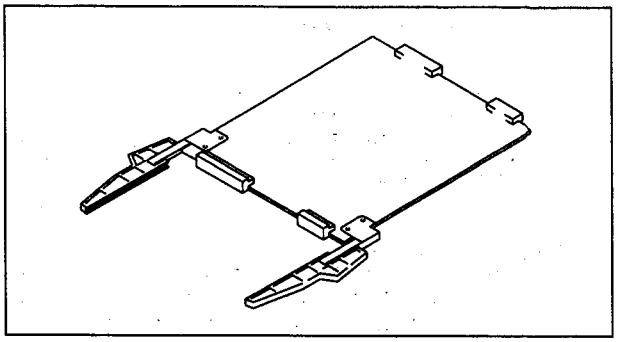
2-13. Fixtures/Measuring Instruments

2-13-1. Fixtures

Extension Board EX-732

Sony Part No. A-8324-779-A

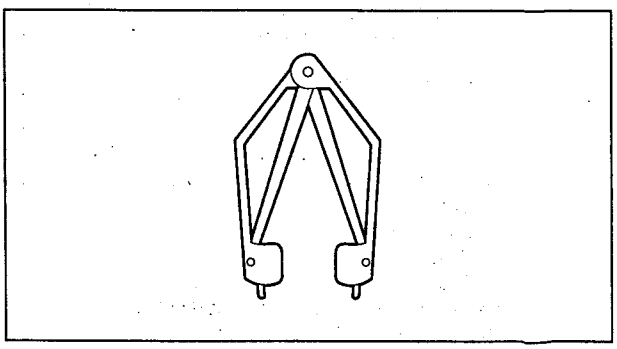
Extension board EX-732 is used for IPM-96/96P, VSW-69/69P, OPM-39/39P boards and optional boards (CMB-12, VIF-19/19P, VIF-20, VSE-36) to inspect and adjust.



PLCC IC Extraction Tool

Sony Part No. J-6035-070-A

This tool is used for extraction of the PLCC ICs.



25-pin Control Cable (5 m)

Sony Part No. 1-575-065-11
This 25-pin Control Cable is used for inspection and adjustment.

Connector Cable (5 m)

Multi Connector Cable (DO BNC)
Sony Part No. J-6031-830-A
Multi Connector Cable(DI BNC)
Sony Part No. J-6031-820-A

Video Cable (S-BNC)

Sony Parts No. J-6381-380-A

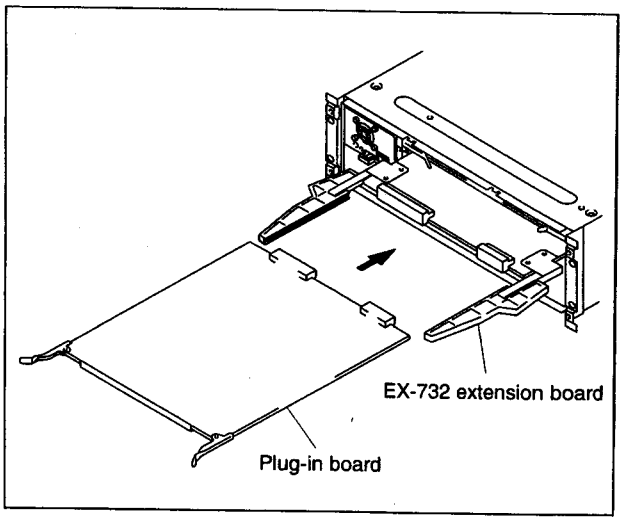
Standerd Product

Spot Heater	HS-600 (100 V)
	HS-600 (117 V)
	HS-600 (220 V)
	HS-600 (240 V)
Nozzle	HS-616 (for HS-600)
	HS-619 (for HS-600)

Connect the Nozzle to the Spot Heater.
These Spot Heater and Nozzle are used for extraction the ICs by warm wind.

2-13-2. How to Use Extension Board

1. Turn off the power of the processor unit.
2. Remove the front panel. (Refer to Section 2-2.)
3. Remove the board stopper assembly. (Refer to Section 2-5-1.)
4. Open the board levers and remove the board.
5. Insert the extension board into the slot from which the board was removed in step 4.
6. As shown in the figure, insert the plug-in board into the extension board.



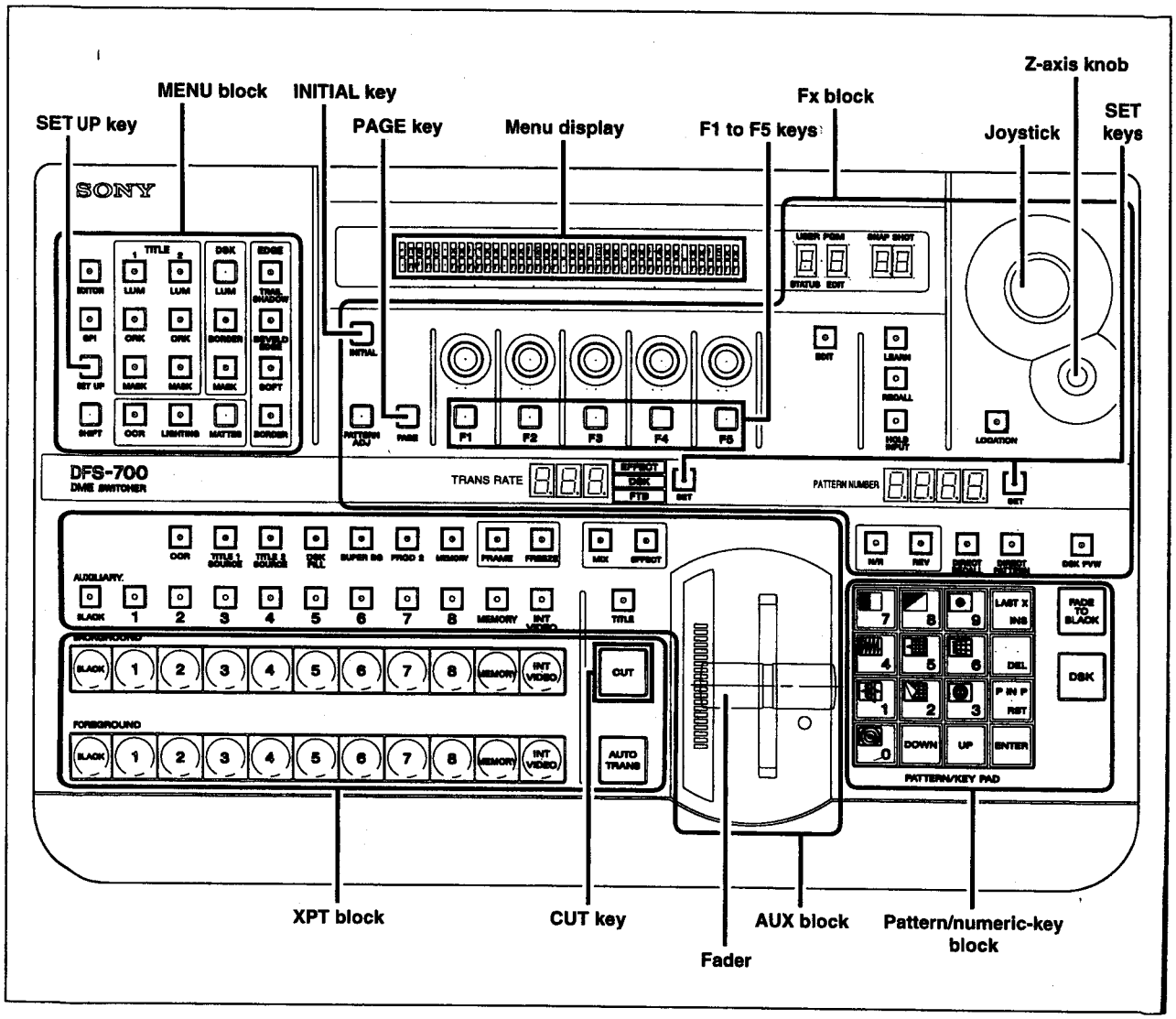
2-13-3. Measuring Instruments

1. Analog Component/Composite Signal Generator
   Equivalent: Tektronix TSG130A (for NTSC)
   Tektronix TSG131A (for PAL)
2. Digital Component Signal Generator
   Equivalent: Tektronix TSG422
3. Waveform/Vectorscope
   Equivalent: Tektronix 1780R (for NTSC)
   Tektronix 1781R (for PAL)
4. Video Monitor
   Equivalent: Sony BVM-14M4DJ
5. Oscilloscope
   Equivalent: Tektronix 2465B
6. Digital Voltmeter
   Equivalent: Hewlett Packard 3435A
7. Frequency Counter
   Equivalent: Hewlett Packard 5313

Section 3
Self-diagnosis

A version and check menu appear on the menu display when some failure occurs during the power-on sequence or normal operation.

The names and positions of buttons and blocks are shown in the figure below.



3-1. Confirmation of Version

For the boards (VSW-69, VSE-36, and CPU-305 boards) below, the version of each item can be confirmed.
The version is confirmed on the menu display of the control panel.

Processor

Board	Check item	Checkpoint on menu display
VSW-69	Main programs (IC920 and IC921)	DFS700
	Effect data (IC923 and IC924)	DATA
VSE-36 (BKDF-712: Option)	Main programs (IC602 to IC605)	BKDF712

Control Panel

Board	Check item	Checkpoint on menu display
CPU-305	System control software (IC54)	Panel

3-1-1. Execution

1. Press the [SET UP] key on the MENU block so that page 1/8 of the SET UP menu appears on the menu display.

< Display example >

```
SYS  SCREEN PPE_RD PORTS  TALLY
1/8    4:3    OFF  PVE500   OFF
```

2. Press the [PAGE] key on the Fx block to switch the display so that page 2/8 appears on the menu display.

< Display example >

```
SYS   INFO   INFO  PW ON          INSTL
2/8  CONFIG↓ VER↓  FACTRY           ↓
```

3. Press the [F2] key to select VER INFORMATION.
The version is displayed at the X.XX portion.

< Display example >

```
INFO DFS700 BKDF712 DATA  Panel   EXIT
1/1    X.XX   X.XX   X.XX   X.XX   ↓
```

3-1-2. Viewing the Version

DFS700: Displays the versions of the main programs (IC920 and IC921) of the VSW-69 board installed in a processor as a standard feature.
BKDF712: Displays the versions of the main programs (IC602 to IC605) of the VSE-36 board (BKDF-712: option) installed in a processor. "0.00" is displayed when BKDF-712 is not installed.
DATA: Displays the versions of the effect data (IC923 and IC924) of the VSW-69 board installed in a processor as a standard feature.
Panel: Displays the version of the system control software (IC54) mounted on the CPU-305 board of the control panel.

3-2. Check Mode

In the check mode, the following items can be confirmed.
- Operation of LEDs, switches, joystick, volumes, and fader
- Menu display
- V sync signal input
- Checksum confirmation of system control software on the CPU-305 board

Two types of modes below are available.
ALL mode: Used when executing all check items continuously. However, each check item cannot be selected.
PART mode: Used during normal operation.

3-2-1. Activation and Termination

To enter the check mode, switch off the power of the processor.
Next, switch on the power of the processor while pressing and holding the following three keys simultaneously on the control panel; the [0] key at the pattern/numeric-key block, the [SET] key at the TRANS RATE block (Fx block), and the [CUT] key at the XPT block. When the check mode is activated, the top menu appears on the menu display.

< Top menu >

```
<<< DFS PANEL HARDWARE DIAGNOSES >>>
      ALL     PART
```

To terminate the check mode, switch off the power of the processor.

3-2-2. Basic Operation

The basic operation is as described below.

F1 to F5 keys: Proceeds to the hierarchical level lower by one. (Selection of check items)
INITIAL key: Returns to the hierarchical level higher by one.

Note

If you cannot understand in which hierarchical level you exist, press the INITIAL key a few times to return to the top menu.

The relation between the menu hierarchy in the check mode, and the boards and parts that can be checked is shown below. The characters in brackets ([ ]) indicate the title that appears on the menu display.

Menu hierarchy	Board that can be checked	Parts that can be checked
TOP MENU		
├[ALL] ALL TEST		
└[PART] PART TEST		Buzzer
├[KY] KY TEST	KY-466 (LE-233, 234, 235) KY-467, 468, LE-227	
│ ├[LED] LED TEST		LEDs, digit indicators, and switch LEDs
│ └[SWITCH] SWITCH TEST		Switches
├[VOL_Fx] VOLUME TEST	VR-263	Volumes at function key block
├[POS/FD] TEST		
│ ├[POS] POS/Z TEST	LC-40, VR-264	Joystick and Z-axis volume
│ └[FADER] FADER TEST		Fader assembly, Fader lever
├[VFD] VFD DISPLAY TEST		Vacuum fluorescent display (Menu display)
└[CPU] CPU TEST	CPU-305	
├[VD] VD TEST		V sync signal input
└[CHKSUM] FLASH CHECKSUM TEST		Checksum of system control software

3-2-3. Checking

Note

For the remedy against the malfunction detected in the checks, refer to "3-3. Troubleshooting".

1. LED Check

LEDs are checked in units of blocks (MENU, Fx, AUX, XPT, and pattern/numeric-key blocks).

(1) At the top menu, press the F2 key. ([PART] selection)
(2) Press the F1 key. ([KY] selection)
(3) Press the F1 key. ([LED] selection)

< LED check menu >

```
PART          NOW TESTING
KYLED
```

XPT and pattern/numeric-key blocks check

(4) Press any key in a block.
(5) Every time you press a key, confirm that the lighting state of all switch LEDs in the block changes in the following order; amber → red → green → going-off → amber •••.

MENU, Fx, and AUX blocks check

(6) Press any transparent and small key.
(7) Every time you press a key, confirm that the lighting state of all switch LEDs and seven-segment LEDs in the block changes between on and off.

Notes

- The three switches below do not light.
  SET UP , DSK LUM , and MATTES (in the MENU block)
- The six switches below light in green.
  LEARN , RECALL , DIRECT RECALL , DIRECT PATTERN (in the Fx block), and two SET (in the TRANS RATE and PATTERN NUMBER sections)
- Other switches light in amber.

2. Switch Check

(1) At the top menu, press the F2 key. ([PART] selection)
(2) Press the F1 key. ([KY] selection)
(3) Press the F2 key. ([SWITCH] selection)

< Switch check menu >

```
PART          NOW TESTING
KYSW
```

(4) Press any switch and confirm that the buzzer sounds.

3. Volume Check

(1) At the top menu, press the F2 key. ([PART] selection)
(2) Press the F2 key. ([VOL_Fx] selection)

< Display example of volume check >

```
PART  F1:ab  F2: 0  F3:ff  F4: c  F5:d4
VOL     ##     #|    | |    | |    | |
```

(3) Rotate a knob clockwise by two turns and confirm that two marks "#" are displayed on the corresponding display section. (One mark "#" is displayed every time you rotate the knob by one turn.)
(4) Confirm that the two-digit value on the right of "Fx:" (x: 1 to 5) changes.

4. Joystick and Z-axis Volume Checks

(1) At the top menu, press the F2 key. ([PART] selection)
(2) Press the F3 key. ([POS/FD] selection)
(3) Press the F1 key. ([POS] selection)

< Display example of joystick check >

```
PART   X:78f   Y: 1c  Z:ea
POS     ##|     | |     ##
```

Joystick check

(4) Move the joystick to the right and left or in the vertical direction and confirm that three marks "#" are displayed below "X:" and "Y:" on the menu display. (One mark "#" is displayed every time you reciprocate the joystick once.)
(5) Confirm that the three-digit values on the right of "X:" and "Y:" on the menu display change.

Z-axis volume check

(6) Rotate the Z-axis knob to the right (clockwise) and confirm that two marks "#" are displayed below "Z:" on the menu display. (One mark "#" is displayed every time you rotate the Z-axis knob once.)
(7) Confirm that the two-digit value on the right of "Z:" on the menu display changes.

5. Fader Check

(1) At the top menu, press the F2 key. ([PART] selection)
(2) Press the F3 key. ([POS/FD] selection)
(3) Press the F2 key. ([FADER] selection)

< Display example of fader check >

```
PART   DATA  Δ
FADER  fff   452    ##|
```

(4) Move the fader from end to end and confirm that four marks "#" are displayed on the corresponding display section. (One mark "#" is displayed every time you reciprocate the fader once.)
(5) Confirm that the three-digit value below "DATA:" on the menu display changes.

6. Menu Display (VFD: Vacuum Fluorescent Display) Check

(1) At the top menu, press the F2 key. ([PART] selection)
(2) Press the F4 key. ([VFD] selection)
(3) Confirm that all-dot "#" lighting, character "U" display, or character " I " display is switched every time you press the F2 key.
(4) During all-dot lighting, confirm that no dots are missing.

Note

If dots are missing, VFD is judged to be defective.

< Display example of menu display check >

```
########################################
########################################
```

↓

```
UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU
UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU
```

↓

```
IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
```

7. V Sync Signal Input Check

(1) At the top menu, press the F2 key. ([PART] selection)
(2) Press the F5 key. ([CPU] selection)
(3) Press the F1 key. ([VD] selection)

< Display example of V sync signal input check >

```
PART
CPUVD          **
```

(4) During check, confirm that "OK" is displayed on the menu display section "**".

8. Check of Program Flash Memory (IC54) Checksum

(1) At the top menu, press the F2 key. ([PART] selection)
(2) Press the F5 key. ([CPU] selection)
(3) Press the F2 key. ([CHKSUM] selection)
(4) After the buzzer for calculation completion sounds, confirm that "OK" is displayed on the menu display.

Note

It takes a few seconds to calculate the checksum.

< Display example of checksum check >
In the case of OK:

```
PART
CPUCS          OK
```

In the case of NG:

```
PART
CPUCS          NG
```

3-3. Troubleshooting

The table below shows the possible cause and remedy for the operating situation (malfunction) that occurs in "3-2. Check Mode".

Checkpoint	Situation	Cause	Remedy
LED	Only one LED does not light.	LED failure	Replace the LED.
	Multiple LEDs do not light.	LED failure	Replace the LEDs.
		IC or the timing signal input to IC is abnormal.	Confirm the connection or replace IC.
	All switches (large switches) on the XPT and pattern/numeric-key blocks do not light.	Defective IC29 on the CPU-305 board.	Replace the IC.
Switch	The buzzer of only one switch does not sound.	Switch failure	Replace the switch.
	The buzzer of multiple switches does not sound.	Switch failure	Replace the switches.
		IC or the timing signal input to IC is abnormal.	Confirm the connection or replace IC.
Volume	Only one knob does not operate.	Knob failure	Replace the knob.
		The flexible flat cable between the VR-263 and KY-466 boards is not connected properly.	Connect the cable.
		Counters (IC208 to IC210, and IC211 to IC214: UPG4702G) on the KY-466 board are defective.	Replace the counters.
	Multiple knobs do not operate.	The flexible flat cable between the VR-263 and KY-466 boards is not connected properly.	Confirm the cable connection or replace the cable.
LED/switch /volume	All LEDs, switches, and knobs (not including the vacuum fluorescent display) do not operate.	The flat cable between the CPU-305 and KY-466 boards is disconnected.	Confirm the cable connection.
		The dual port SRAM (IC64) or dual port memory controller are defective.	Replace the IC.
Joystick	Operation failure	Joystick trouble	Replace the joystick.
		The harness between the LC-40 and KY-466 boards is disconnected.	Confirm the harness connection or replace the harness.
		The A/D converter (IC215: μ PD7004) on the KY-466 board is defective.	Replace the A/D converter.
Fader	Operation failure	An encoder supplied for the fader is defective.	Replace the encoder.
		The harness connected with the KY-466 board is disconnected.	Confirm the harness connection or replace the harness.
		The counter (IC211: μ PD4701) on the KY-466 board is defective.	Replace the counter.
V sync signal input	"NG" is displayed on the menu display.	RS-422 transceiver (IC24) failure	Replace the RS-422 transceiver (IC24).
		The cable connected to pin 7 or 20 of CN21 on the CPU-305 board is disconnected.	Confirm the connection or replace the connector.
Vacuum fluorescent display (VFD)	"#" is missing during all-dot lighting.	The vacuum fluorescent display is defective.	Replace the vacuum fluorescent display.
	No display	The vacuum fluorescent display, IC62, or IC63 is defective, or the harness connected with the CPU board is removed or disconnected.	Confirm the harness connection or replace the harness, vacuum fluorescent display, IC62, or IC63.

Section 4
Electrical Alignment

4-1. Adjustment Sequence

OPM-39/39P Board Adjustment

4-2. Preparation for Adjustment

4-3-1. +5 V DC Voltage Adjustment

4-3-2. +3.3 V DC Voltage Adjustment

4-3-3. SDI VCO Free-running Frequency Adjustment

4-3-4. PGM OUT Component Y Gain Adjustment

4-3-5. PGM OUT Component R-Y Gain Adjustment

4-3-6. PGM OUT Component B-Y Gain Adjustment

4-3-7. PGM OUT Component Y/C Delay Adjustment

4-3-8. Composite SC Leak Balance Adjustment

4-3-9. Composite Y Gain Adjustment

4-3-10. Composite Modulation AXIS Adjustment

4-3-11. Composite Y/C Delay Adjustment

4-3-12. Composite C Gain Adjustment

4-3-13. Composite Burst Balance Adjustment (For PAL only)

4-3-14. Composite Burst Level Adjustment

4-3-15. S VIDEO Y Gain Adjustment

4-3-16. S VIDEO C Gain Adjustment

4-3-17. Black Burst OUT SC Leak Balance Adjustment

4-3-18. Black Burst OUT Burst Balance Adjustment (For PAL only)

4-3-19. Black Burst OUT SC Phase Adjustment

4-3-20. Black Burst OUT SYNC Level Adjustment

4-3-21. Black Burst OUT Burst Level Adjustment

4-3-22. INT SC Frequency Adjustment

4-3-23. INT SCH Phase Adjustment

4-3-24. INT Black Burst OUT SCH Phase Adjustment

4-3-25. Preread ON PGM OUT SCH Phase Adjustment (For PAL only)

4-3-26. Preread ON PGM OUT Burst Start Adjustment (For PAL only)

4-3-27. GEN Lock H Phase Adjustment

4-3-28. GEN Lock SC Phase Adjustment

4-3-29. PVW OUT Video Gain Adjustment

4-3-30. DSK EXT Key Clamp Level Adjustment

4-3-31. DSK EXT Key Gain Adjustment

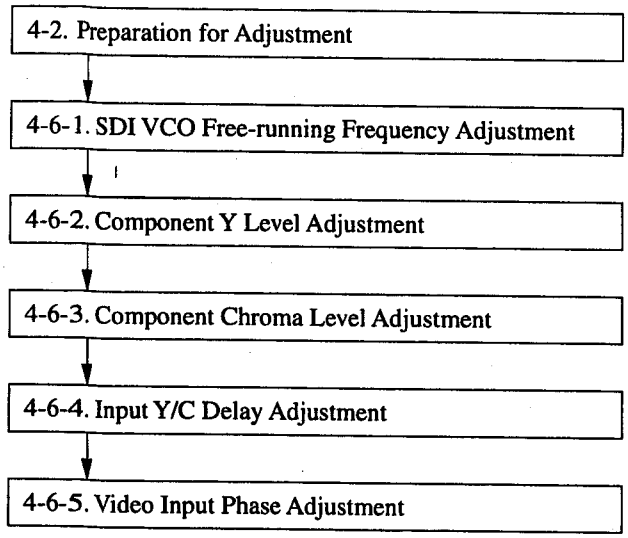
IPM-96/96P Board Adjustment

- 4-2. Preparation for Adjustment
- 4-4-1. SDI VCO Free-running Frequency Adjustment
- 4-4-2. Component Y Level Adjustment
- 4-4-3. Component Chroma Level Adjustment
- 4-4-4. Input Y/C Delay Adjustment
- 4-4-5. Video Input Phase Adjustment
- 4-4-6. RGB Converted Y Level Adjustment
- 4-4-7. RGB Converted Chroma Level Adjustment

VIF-19/19P Board Adjustment

- 4-2. Preparation for Adjustment
- 4-5-1. Composite Y Level Adjustment
- 4-5-2. S VIDEO Clamp DC Level Adjustment
- 4-5-3. SYNC Separate Adjustment
- 4-5-4. H Lock Loop Adjustment
- 4-5-5. Burst Delay Adjustment
- 4-5-6. Composite Input Y Gain Adjustment
- 4-5-7. Composite Input Chroma Level Adjustment
- 4-5-8. S VIDEO Input Gain Adjustment
- 4-5-9. Composite Input Y/C Delay Adjustment
- 4-5-10. S VIDEO Input Y/C Delay Adjustment
- 4-5-11. Video Input Phase Adjustment

VIF-20/20P Board Adjustment

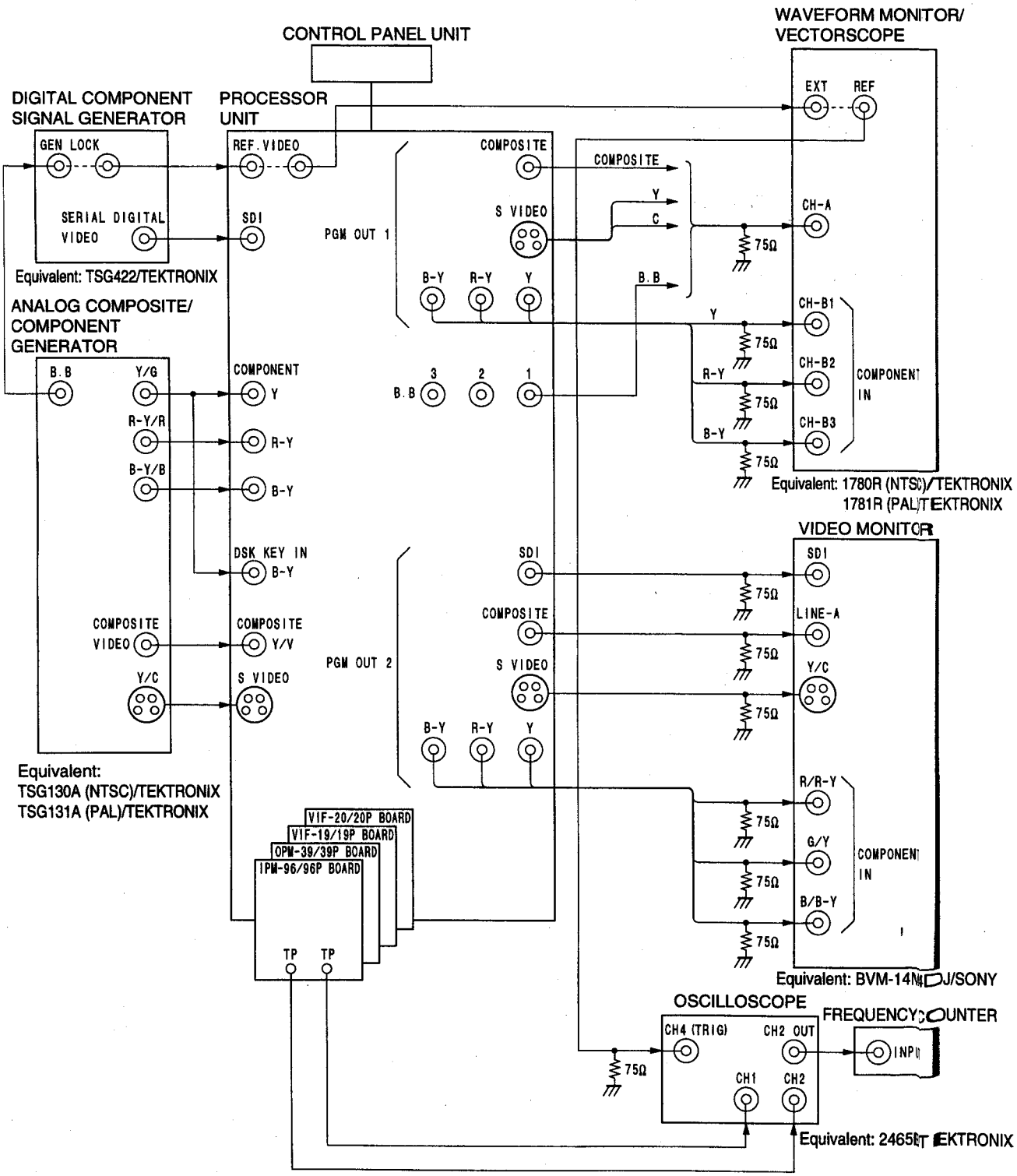

4-2. Preparation for Adjustment
4-6-1. SDI VCO Free-running Frequency Adjustment
4-6-2. Component Y Level Adjustment
4-6-3. Component Chroma Level Adjustment
4-6-4. Input Y/C Delay Adjustment
4-6-5. Video Input Phase Adjustment

4-2. Preparation for Adjustment

Connection

Note

For the tools and measurement equipment used for each adjustment, refer to "2-13. Fixtures/Measuring Instruments".



4-3. OPM-39/39P Board Adjustment

4-3-1. +5 V DC Voltage Adjustment

For NTSC/PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2.		
STEP-2 • Digital Voltmeter	TP901/OPM-39, OPM-39P (A-3) TP903/OPM-39, OPM-39P (A-4) GND • Specification: 5.00 ±0.05 V dc	+5 V DC voltage adjustment ⊘ RV901/OPM-39 (A-3) ⊘ RV901/OPM-39P (A-3)

4-3-2. +3.3 V DC Voltage Adjustment

For NTSC/PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP1 • Connection: Refer to Section 4-2.		
STEP2 • Digital Voltmeter	TP902/OPM-39, OPM-39P (A-3) TP903/OPM-39, OPM-39P (A-4) GND • Specification: 3.30 ±0.03 V dc	+3.3 V DC voltage adjustment ⊘ RV902/OPM-39 (A-3) ⊘ RV902/OPM-39P (A-3)

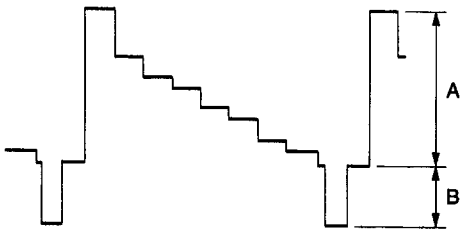
4-3-3. SDI VCO Free-running Frequency Adjustment

For NTSC/PAL

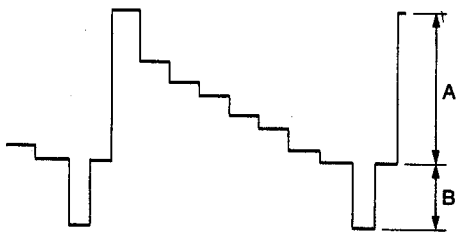
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/39P board with an extension board EX-732. • Switch setting: S401/OPM-39, OPM-39P (K-9): ON S501/OPM-39, OPM-39P (L-7): ON		
STEP-2 • Frequency counter	• Specification: 27.00 ±0.27 MHz	Free-running frequency adjustment (NTSC) ⊘ RV401/OPM-39 (K-9): TP401/OPM-39 (L-8) ⊘ RV501/OPM-39 (L-7): TP501/OPM-39 (M-8) (PAL) ⊘ RV401/OPM-39P (K-9): TP401/OPM-39P (L-8) ⊘ RV501/OPM-39P (L-7): TP501/OPM-39P (M-8)
STEP-3 • After completing the adjustment, set the switches S401 (K-9) and S501 (L-7) on the OPM-39/39P board to OFF.		

4-3-4. PGM OUT Component Y Gain Adjustment

For NTSC

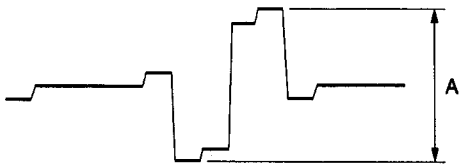
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	COMPONENT Y OUT  A = 714 ±5 mV p-p B = 286 ±4 mV p-p	A: Y gain adjustment ● RV603/OPM-39 (A-6) B: SYNC level (Y) ● RV701/OPM-39 (B-7)

For PAL

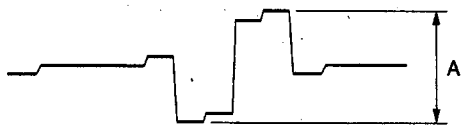
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	COMPONENT Y OUT  A = 700 ±5 mV p-p B = 300 ±4 mV p-p	A: Y gain adjustment ● RV603/OPM-39P (A-6) B: SYNC level (Y) ● RV701/OPM-39P (B-7)

4-3-5. PGM OUT Component R-Y Gain Adjustment

For NTSC

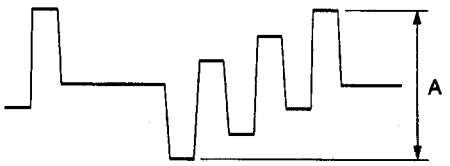
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) Is used. (1) Waveform Monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	COMPONENT R-Y OUT  A = 700 ±5 mV p-p	R-Y gain adjustment ⊘ RV604/OPM-39 (A-6)

For PAL

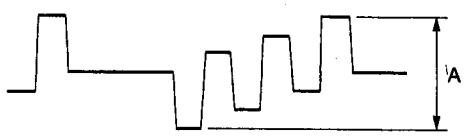
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	COMPONENT R-Y OUT  A = 525 ±7 mV p-p	R-Y gain adjustment ⊘ RV604/OPM-39P (A-6)

4-3-6. PGM OUT Component B-Y Gain Adjustment

For NTSC

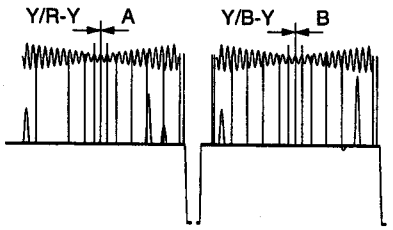
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	COMPONENT B-Y OUT  A = 700 ±5 mV p-p	B-Y gain adjustment ⊘ RV605/OPM-39 (A-7)

For PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	COMPONENT B-Y OUT  A = 525 ±7 mV p-p	B-Y gain adjustment ⊘ RV605/OPM-39P (A-7)

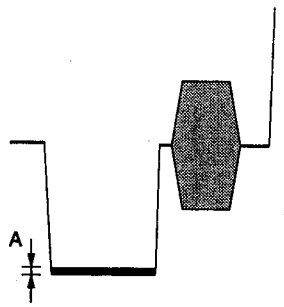
4-3-7. PGM OUT Component Y/C Delay Adjustment

For NTCS/PAL

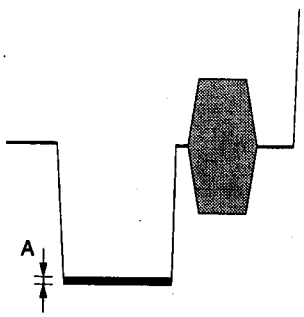
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/39P board with an extension board EX-732. • Test signal: SDI 500 kHz BOWTIE		
STEP-2 • Waveform monitor MEASURE: BOWTIE INPUT: CH-B1 (COMPONENT Y) CH-B2 (COMPONENT R-Y) CH-B3 (COMPONENT B-Y) MODE: WAVEFORM REF: EXT	CH-B1: PGM OUT (COMPOMEMT Y) CH-B2: PGM OUT (COMPONENT R-Y) CH-B3: PGM OUT (COMPONENT B-Y)  A = 0 ±20 ns B = 0 ±20 ns • Set the each BOWTIE DIP point A and B on the center marker.	Y/R-Y delay adjustment ⊘ RV601/OPM-39 (D-6) ⊘ RV601/OPM-39P (D-6) Y/B-Y delay adjustment ⊘ RV602/OPM-39 (D-6) ⊘ RV602/OPM-39P (D-6)

4-3-8. Composite SC Leak Balance Adjustment

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 µs/DIV TRIG: B.B (CH4)	COMPOSITE OUT  A = 20 mV p-p or less (Adjust to minimum.)	SC leak (R-Y) adjustment ⊘ RV703/OPM-39 (B-8) SC leak (B-Y) adjustment ⊘ RV709/OPM-39 (D-8)

For PAL

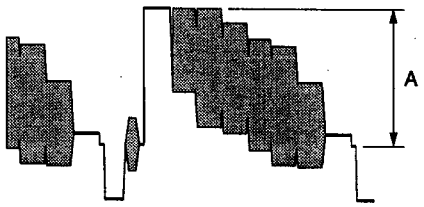
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 µs/DIV TRIG: B.B (CH4)	COMPOSITE OUT  A = 20 mV p-p or less (Adjust to minimum.)	SC leak adjustment ⊘ RV703/OPM-39P (B-8) SC leak (B-Y) adjustment ⊘ RV709/OPM-39P (D-8)

4-3-9. Composite Y Gain Adjustment

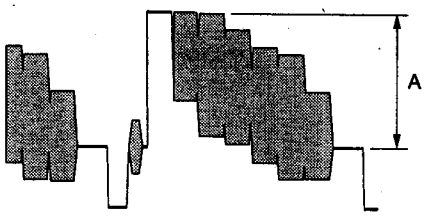
Note

Perform "4-3-4. PGM OUT Component Y Gain Adjustment" in advance.

For NTSC

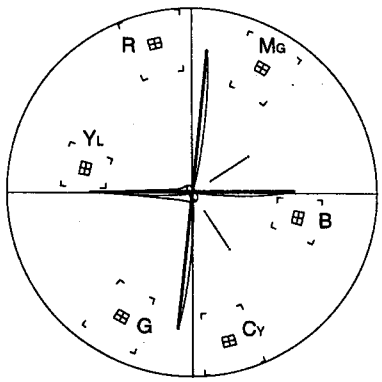
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	COMPOSITE OUT  A = 714 ±5 mV p-p	Composite gain adjustment ⊘ RV705/OPM-39 (A-8)

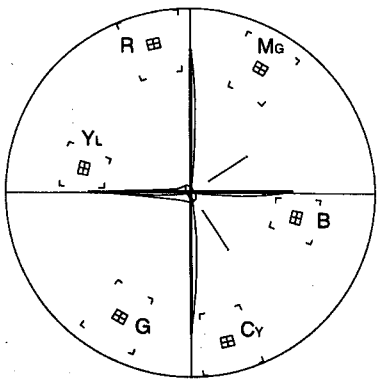
For PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	COMPOSITE OUT  A = 700 ±5 mV p-p	Composite gain adjustment ⊘ RV705/OPM-39P (A-8)

4-3-10. Composite Modulation AXIS Adjustment

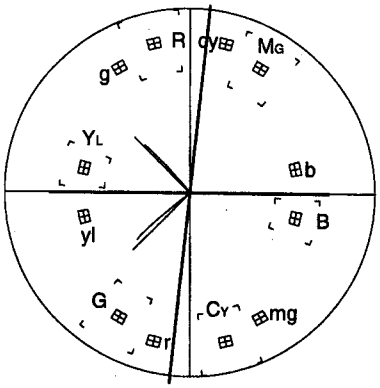
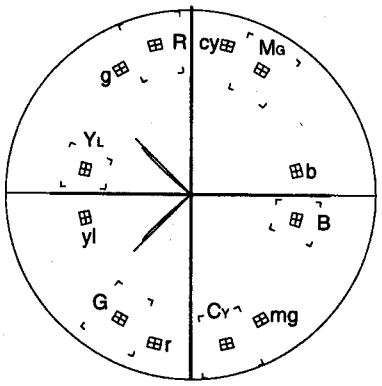
For NTSC

<table>
<tr><th>Machine Conditions for Adjustment</th><th>Specifications</th><th>Adjustment Point</th></tr>
<tr><td colspan="3">STEP-1
• Connection: Refer to Section 4-2.
• Extension board: Extend the OPM-39 board with an extension board EX-732.
• Test signal: Analog component quad phase</td></tr>
<tr><td>STEP-2
• Vectorscope
75 %, Setup
L. DISP: VECT
INPUT: CH-A
FILTER: FLAT
REF: EXT</td><td>PGM OUT (COMPOSITE)
 

• Adjust the phase shift control so that the B-Y signal on the vectorscope coincides with the U axis.</td><td></td></tr>
<tr><td>STEP-3
• Vectorscope
75 %, Setup
L. DISP: VECT
INPUT: CH-A
FILTER: FLAT
REF: EXT</td><td>PGM OUT (COMPOSITE)
 

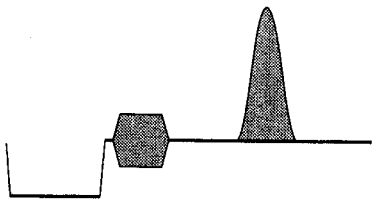
• Adjust ⊘RV711 so that the R-Y signal on the vectorscope coincides with the V axis.</td><td>Modulation AXIS adjustment
⊘ RV711/OPM-39 (D-8)</td></tr>
</table>

For PAL

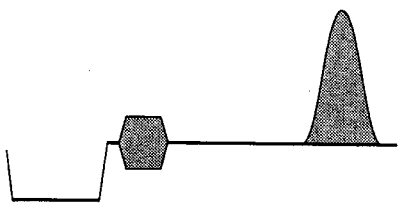
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732. • Test signal: Analog component quad phase		
STEP-2 • Vectorscope 75 % L. DISP: VECT INPUT: CH-A FILTER: FLAT REF: EXT	PGM OUT (COMPOSITE)  • Adjust the phase shift control so that the B-Y signal on the vectorscope coincides with the U axis.	
STEP-3 • Vectorscope 75 % L. DISP: VECT INPUT: CH-A FILTER: FLAT REF: EXT	PGM OUT (COMPOSITE)  • Adjust ⊘RV711 so that the R-Y signal on the vectorscope coincides with the V axis.	Modulation AXIS adjustment ⊘ RV711/OPM-39P (D-8)

4-3-11. Composite Y/C Delay Adjustment

For NTSC

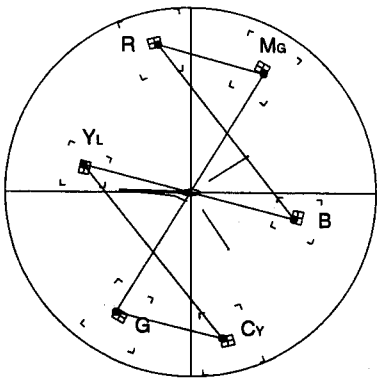
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732. • Test signal: SDI MOD pulse & bar (MOD 12.5T)		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A (COMPONENT Y) MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 2 µs/DIV TRIG: B.B (CH4)	CH-B1: PGM OUT (COMPOSITE)  • Adjust so that the Y/C phase is the same in phase (the base line of a 12.5T modulation pulse is symmetrical with the pulse time base in the center).	Y/C delay adjustment ● RV713/OPM-39 (D-9)

For PAL

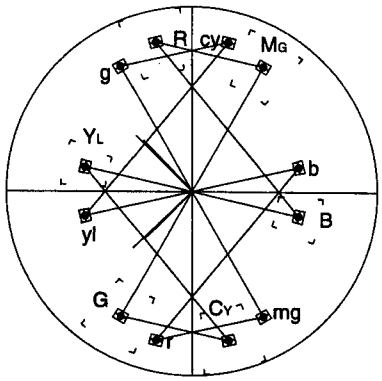
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732. • Test signal: SDI MOD pulse & bar (MOD 12.5T)		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A (COMPONENT Y) MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 2 µs/DIV TRIG: B.B (CH4)	CH-B1: PGM OUT (COMPOSITE)  • Adjust so that the Y/C phase is the same in phase (the base line of a 12.5T modulation pulse is symmetrical with the pulse time base in the center).	Y/C delay adjustment ● RV713/OPM-39P (D-9)

4-3-12. Composite C Gain Adjustment

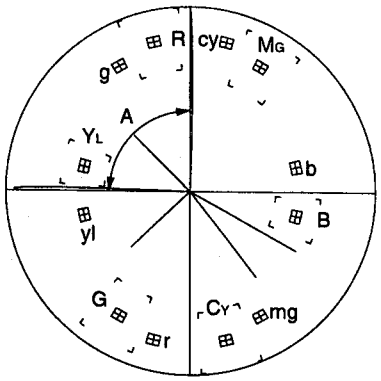
For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • Vectorscope 75 %, Setup L.DISP: VECT INPUT: CH-A FILTER: FLAT REF: EXT	COMPOSITE OUT  • Adjust ⊘RV702 and ⊘RV701 so that the luminance points for MG, B, CY, G, YL, and R on the vectorscope are located in each ⊞ mark.	C level adjustment ⊘ RV702/OPM-39 (C-9) B-Y AXIS level adjustment ⊘ RV701/OPM-39 (B-7)

For PAL

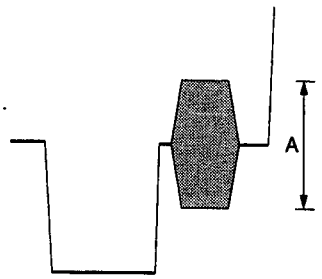
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • Vectorscope 75 % L.DISP: VECT INPUT: CH-A FILTER: FLAT REF: EXT	COMPOSITE OUT  • Adjust ⊘RV702 and ⊘RV701 so that the luminance points for MG, mg, B, b, CY, cy, G, g, YL, yl, R, and r on the vectorscope are located in each ⊞ mark.	C level adjustment ⊘ RV702/OPM-39P (C-9) B-Y AXIS level adjustment ⊘ RV701/OPM-39P (B-7)

4-3-13. Composite Burst Balance Adjustment (For PAL only)

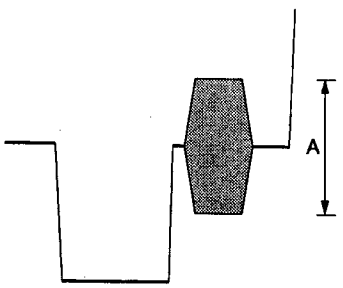
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732.		
STEP-2 • Vectorscope 75 % L.DISP: VECT INPUT: CH-A FILTER: FLAT REF: EXT	COMPOSITE OUT  • Set the spot of BURST on the position of circumference by GAIN control on the vectorscope. Then adjust ⊘RV704 so that A is the specification. A = 90 ±0.5°	Burst balance adjustment ⊘ RV704/OPM-39P (C-9)

4-3-14. Composite Burst Level Adjustment

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 µs/DIV TRIG: B.B (CH4)	COMPOSITE OUT  A = 286 ±4 mV p-p	Burst level (PGM) adjustment ● RV706/OPM-39 (C-7)

For PAL

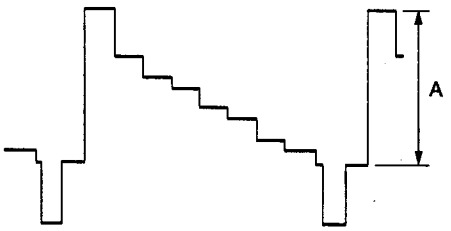
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 µs/DIV TRIG: B.B (CH4)	COMPOSITE OUT  A = 300 ±4 mV p-p	Burst level (PGM) adjustment ● RV706/OPM-39P (C-7)

4-3-15. S VIDEO Y Gain Adjustment

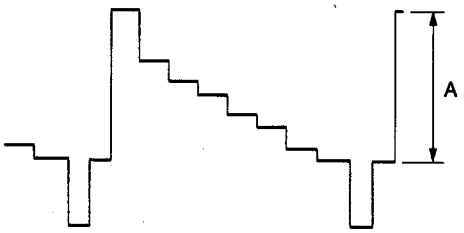
Note

Perform "4-3-4. PGM OUT Component Y Gain Adjustment" in advance.

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	S VIDEO Y OUT  A = 714 ±5 mV p-p	S-Y gain adjustment ⊘ RV710/OPM-39 (A-8) (Front)

For PAL

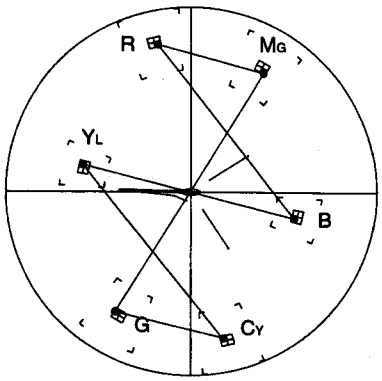
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	S VIDEO Y OUT  A = 700 ±5 mV p-p	S-Y gain adjustment ⊘ RV710/OPM-39P (A-8) (Front)

4-3-16. S VIDEO C Gain Adjustment

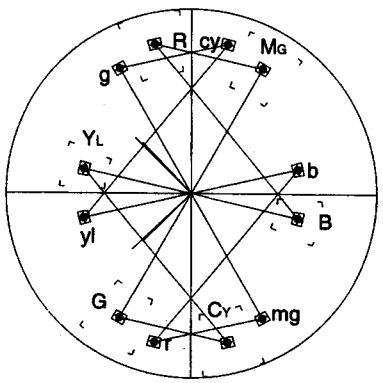
Note

Perform "4-3-12. Composite C Gain Adjustment" in advance.

For NTSC

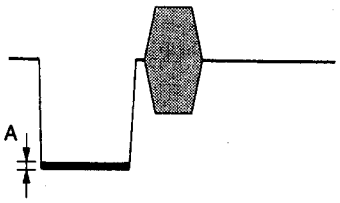
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Test signal: SDI 75 % color bars		
STEP-2 • Vectorscope 75 %, Setup L.DISP: VECT INPUT: CH-A FILTER: FLAT REF: EXT	S VIDEO C OUT  • Adjust ⊘RV712 so that the luminance points for MG, B, CY, G, YL, and R on the vectorscope are located in each ⊞ mark.	S-C gain adjustment ⊘ RV712/OPM-39 (A-8) (Front)

For PAL

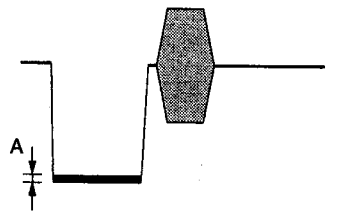
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Test signal: SDI 75 % color bars		
STEP-2 • Vectorscope 75 % L.DISP: VECT INPUT: CH-A FILTER: FLAT REF: EXT	S VIDEO C OUT  • Adjust ⊘RV712 so that the luminance points for MG, B, CY, G, YL, and R on the vectorscope are located in each ⊞ mark.	S-C gain adjustment ⊘ RV712/OPM-39P (A-8) (Front)

4-3-17. Black Burst OUT SC Leak Balance Adjustment

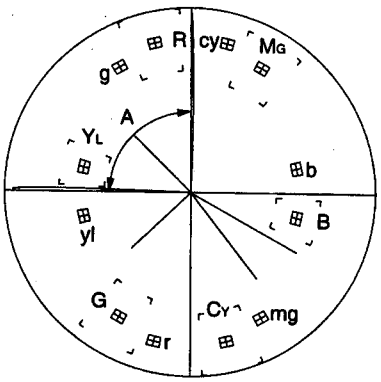
For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732.		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 µs/DIV TRIG: B.B (CH4)	B.B OUT  A = 20 mV p-p or less (Adjust to minimum.)	SC leak (V) adjustment ● RV718/OPM-39 (F-7) SC leak (U) adjustment ● RV720/OPM-39 (G-7)

For PAL

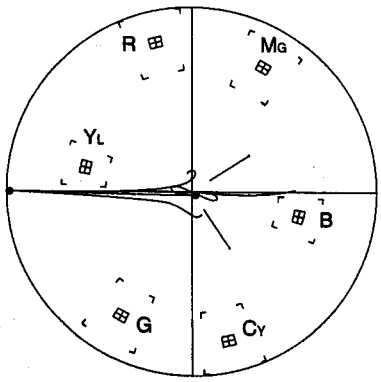
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732.		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 µs/DIV TRIG: B.B (CH4)	B.B OUT  A = 20 mV p-p or less (Adjust to minimum.)	SC leak (V) adjustment ● RV718/OPM-39P (F-7) SC leak (U) adjustment ● RV720/OPM-39P (G-7)

4-3-18. Black Burst OUT Burst Balance Adjustment (For PAL only)

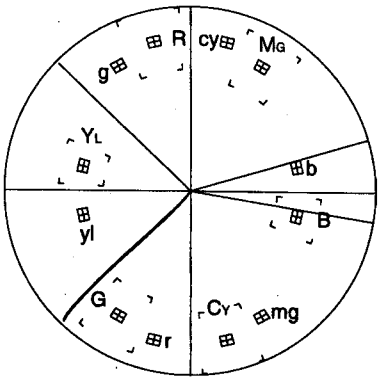
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732.		
STEP-2 • Vectorscope 75 % L.DISP: VECT INPUT: CH-A FILTER: FLAT REF: EXT	B.B OUT  • Set the spot of BURST on the position of circumference by GAIN control on the vectorscope. Then adjust ⊘RV717 so that A is the specification. A = 90 ±0.5°	Burst balance adjustment ⊘ RV717/OPM-39P (F-7)

4-3-19. Black Burst OUT SC Phase Adjustment

For NTSC

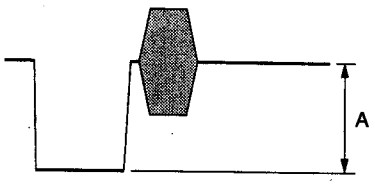
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • Vectorscope 75 %, Setup L.DISP: VECT INPUT: CH-A/CH-B FILTER: FLAT REF: EXT	CH-A: PGM OUT (COMPOSITE) CH-B: B.B OUT  • Switch CH-A and CH-B on the vectorscope alternately for measurement. • Adjust the phase of a B.B OUT BURST signal to that of a PGM OUT BURST signal. • Specification: 0 ±1°	B.B OUT SC phase adjustment ● RV721/OPM-39 (H-8)

For PAL

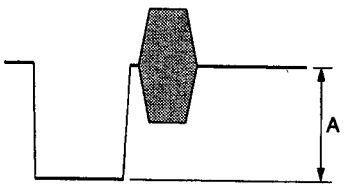
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732.		
STEP-2 • Vectorscope 75 % L.DISP: VECT INPUT: CH-A/CH-B FILTER: FLAT REF: EXT	CH-A: PGM OUT (COMPOSITE) CH-B: B.B OUT  • Switch CH-A and CH-B on the vectorscope alternately for measurement. • Adjust the phase of a B.B OUT BURST signal to that of a PGM OUT BURST signal. • Specification: 0 ±1°	B.B OUT SC phase adjustment ● RV721/OPM-39P (H-8)

4-3-20. Black Burst OUT SYNC Level Adjustment

For NTSC

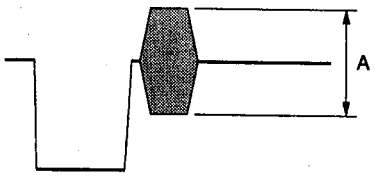
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732.		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 µs/DIV TRIG: B.B (CH4)	B.B OUT  A = 286 ±4 mV p-p	SYNC level adjustment ⊘ RV714/OPM-39 (E-7)

For PAL

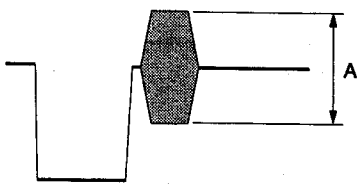
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732.		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 µs/DIV TRIG: B.B (CH4)	B.B OUT  A = 300 ±4 mV p-p	SYNC level adjustment ⊘ RV714/OPM-39P (E-7)

4-3-21. Black Burst OUT Burst Level Adjustment

For NTSC

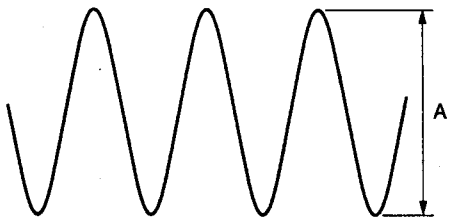
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732.		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 µs/DIV TRIG: B.B (CH4)	B.B OUT  A = 286 ±4 mV p-p	SYNC level adjustment ● RV715/OPM-39 (E-7)

For PAL

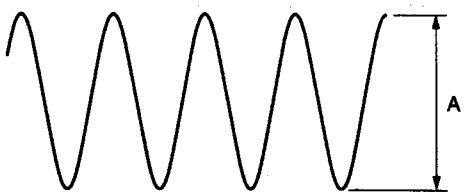
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732.		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 µs/DIV TRIG: B.B (CH4)	B.B OUT  A = 300 ±4 mV p-p	SYNC level adjustment ● RV715/OPM-39P (E-7)

4-3-22. INT SC Frequency Adjustment

For NTSC

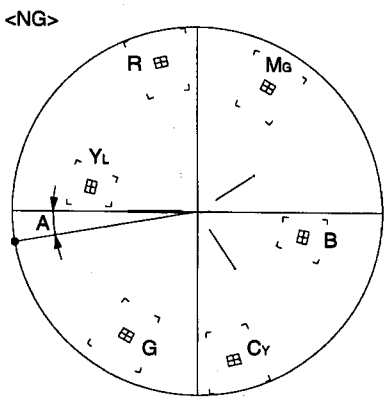
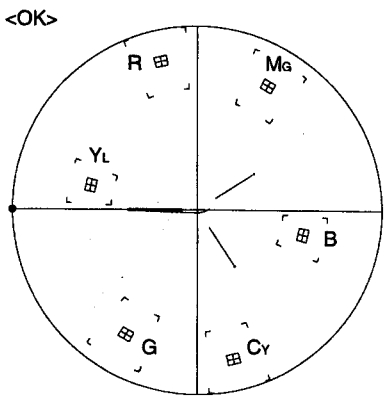
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732.		
STEP-2 • Oscilloscope CH2: 200 mV/DIV (AC) 100 ns/DIV TRIG: CH2	CH2: TP106/OPM-39 (D-1)  A = 0.9 ±0.2 V p-p • Check that the specification above is satisfied.	(Check)
STEP-3 • Set the oscilloscope as follows. CH2: 200 mV/DIV (AC) • Connect a frequency counter to CH2 OUT of the oscilloscope.	• Specification: 3,579,545 ±5 Hz • Check that D101/OPM-39(A-6) is off.	SC frequency adjustment ⊘ RV101/OPM-39 (D-4)

For PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732.		
STEP-2 • Oscilloscope CH2: 200 mV/DIV (AC) 100 ns/DIV TRIG: CH2	CH2: TP106/OPM-39P (D-1)  A = 0.9 ±0.2 V p-p • Check that the specification above is satisfied.	(Check)
STEP-3 • Set the oscilloscope as follows. CH2: 200 mV/DIV (AC) • Connect a frequency counter to CH2 OUT of the oscilloscope.	• Specification: 4,433,619 ±5 Hz • Check that D101/OPM-39P(A-6) is off.	SC frequency adjustment ⊘ RV101/OPM-39P (D-4)

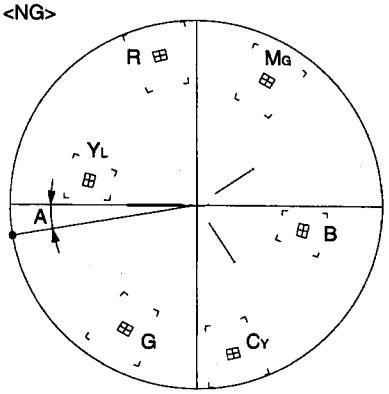
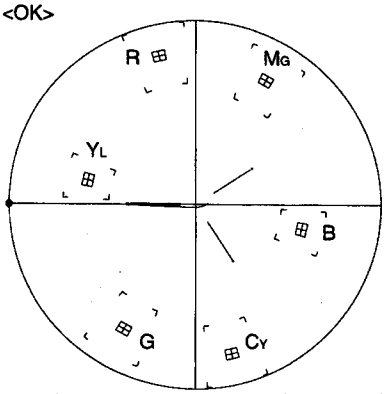
4-3-23. INT SCH Phase Adjustment

For NTSC

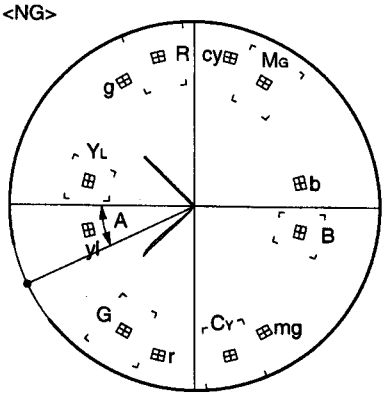
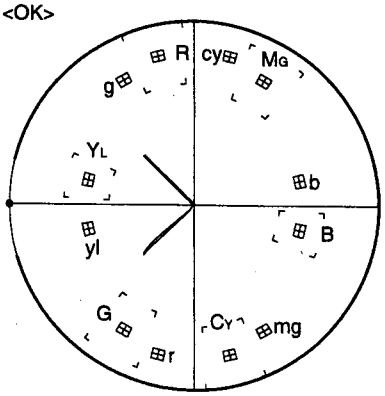
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732.		
STEP-2 • Vectorscope 75 %, Setup L.DISP: SCH INPUT: CH-A FILTER: FLAT GAIN: VAR REF: INT	PGM OUT (COMPOSITE) <NG>  <OK>  A = 0 ±0.5°	INT SC phase adjustment ● RV102/OPM-39 (C-1)

4-3-23. INT SCH Phase Adjustment

For NTSC

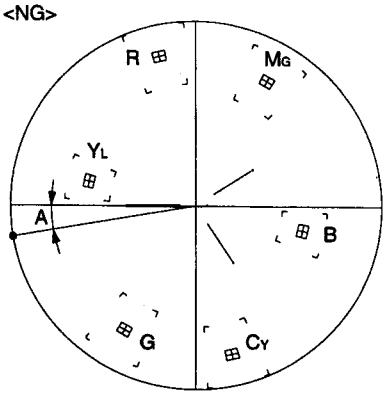
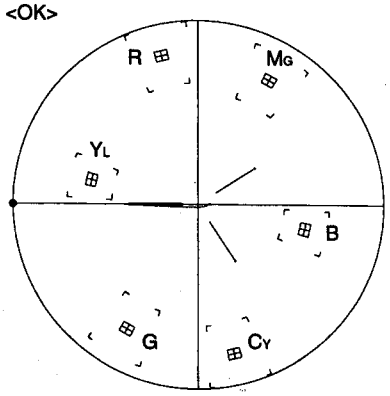
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732.		
STEP-2 • Vectorscope 75 %, Setup L.DISP: SCH INPUT: CH-A FILTER: FLAT GAIN: VAR REF: INT	PGM OUT (COMPOSITE) <NG>  <OK>  A = 0 ±0.5°	INT SC phase adjustment ● RV102/OPM-39 (C-1)

For PAL

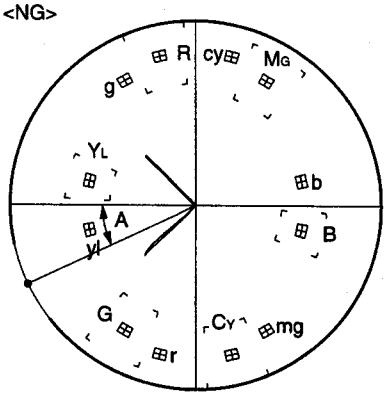
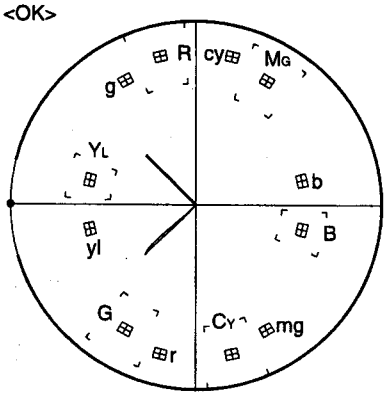
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732.		
STEP-2 • Vectorscope 75 % L.DISP: SCH INPUT: CH-A FILTER: FLAT GAIN: VAR REF: INT	PGM OUT (COMPOSITE) <NG>  <OK>  A = 0 ±0.5°	INT SC phase adjustment ● RV102/OPM-39P (C-1)

4-3-24. INT Black Burst OUT SCH Phase Adjustment

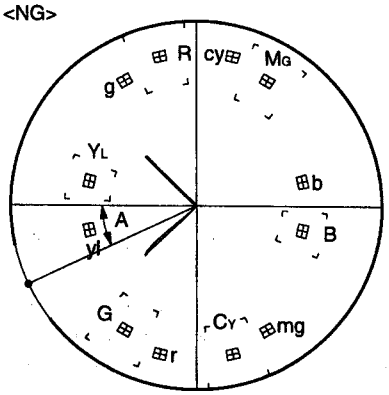
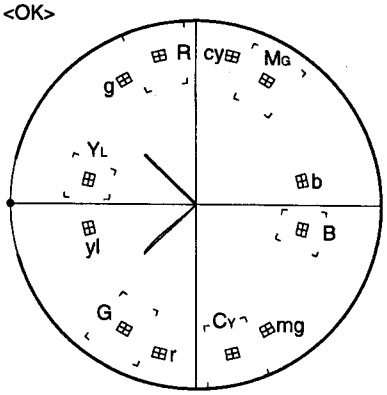
For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732.		
STEP-2 • Vectorscope 75 %, Setup L.DISP: SCH INPUT: CH-A FILTER: FLAT GAIN: VAR REF: INT	B.B OUT <NG>  <OK>  A = 0 ±0.5°	INT B.B OUT SCH phase adjustment ● RV105/OPM-39 (B-4)

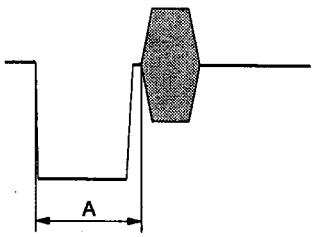
For PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732.		
STEP-2 • Vectorscope 75 % L.DISP: SCH INPUT: CH-A FILTER: FLAT GAIN: VAR REF: INT	B.B OUT <NG>  <OK>  A = 0 ±0.5°	INT B.B OUT SCH phase adjustment ● RV105/OPM-39P (B-4)

4-3-25. Preread ON PGM OUT SCH Phase Adjustment (For PAL only)

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • Vectorscope 75 % L.DISP: SCH INPUT: CH-A FILTER: FLAT GAIN: VAR REF: INT	PGM OUT (COMPOSITE) <NG>  <OK>  A = 0 ±0.5°	PREREAD ON PGM OUT SCH phase adjustment ● RV106/OPM-39P (B-3)

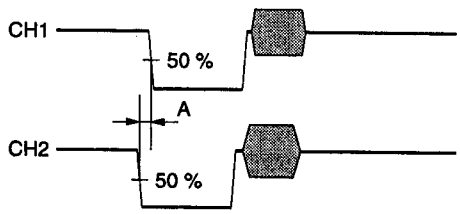
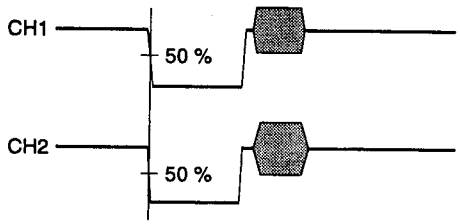
4-3-26. Preread ON PGM OUT Burst Start Adjustment (For PAL only)

<table>
<tr><th>Machine Conditions for Adjustment</th><th>Specifications</th><th>Adjustment Point</th></tr>
<tr><td colspan="3">STEP-1
• Connection: Refer to Section 4-2.
• Extension board: Extend the OPM-39P board with an extension board EX-732.
• Test signal: SDI 75 % color bars</td></tr>
<tr><td>STEP-2
• (1) or (2) is used.
(1) Waveform Monitor
INPUT: CH-A
MODE: WAVEFORM
REF: INT
(2) Oscilloscope
CH1: 100 mV/DIV
2 µs/DIV
TRIG: B.B (CH4)</td><td>COMPOSITE OUT
 

• Adjust ⊘RV107 so that burst start A of a Pre Read ON PGM OUT signal is the same as burst start B of a Preread OFF PGM OUT (Normal PGM OUT) signal.</td><td>PREREAD ON PGM OUT burst start (PGM) adjustment
⊘ RV107/OPM-39P (C-1)</td></tr>
</table>

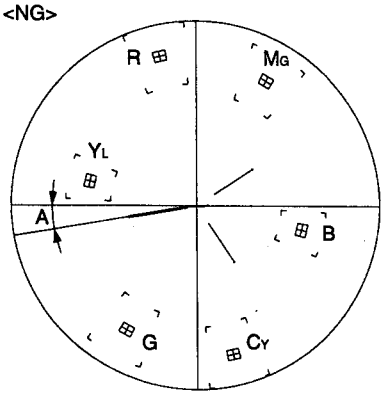
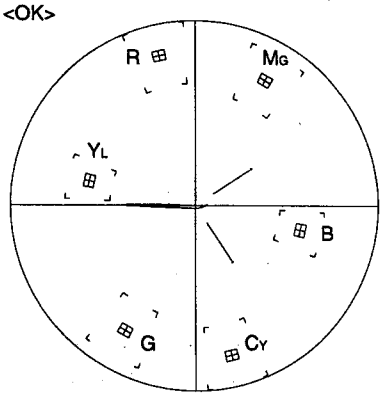
4-3-27. GEN Lock H Phase Adjustment

For NTSC/PAL

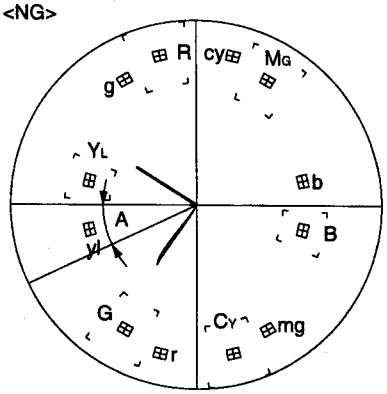
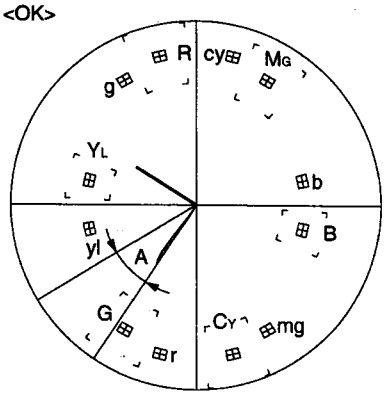
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Connect the REF. VIDEO connector to CH1 of the oscilloscope. • Connect the PGM COMPOSITE connector to CH2 of the oscilloscope and select the BLACK input button.		
STEP-2 • Oscilloscope CH1: 200 mV/DIV 2 µs/DIV CH2: 200 mV/DIV 2 µS/DIV TRIG: B.B (CH4)	CH1: REF. VIDEO CH2: PGM COMPOSITE (BLACK) <NG>  <OK>  A = 0 ±50 ns • Check that D101/OPM-39 (A-6) lights up. (for NTSC) • Check that D101/OPM-39P (A-6) lights up. (for PAL) • Adjust ⊘RV104 (A-5) and S101 (A-5) so that the specification above is satisfied.	H phase fine adjustment ⊘ RV104/OPM-39 (A-5) (Front) ⊘ RV104/OPM-39P (A-5) (Front) H phase coarse S101/OPM-39 (A-5) (Front) S101/OPM-39P (A-5) (Front)

4-3-28. GEN Lock SC Phase Adjustment

For NTSC

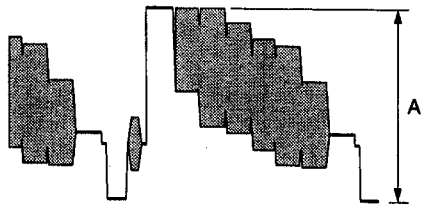
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Connect the PGM COMPOSITE connector to CH-A on the waveform monitor/vectorscope and select the BLACK input button. • Connect the REF. VIDEO connector to CH-B on the waveform monitor/vectorscope.		
STEP-2 • Vectorscope 75 %, Setup L.DISP: VECT INPUT: CH-A FILTER: FLAT GAIN: VAR REF: EXT	CH-A: PGM COMPOSITE <NG>  <OK>  A = 0 ±0.5° • Adjust the burst phase of a REF. VIDEO vectorscope waveform to 0° (counterclockwise) in CH-B. • Switch to the PGM COMPOSITE vectorscope waveform in CH-A and adjust S102 and RV103 so that the burst phase is 0°.	SC phase fine adjustment ● RV103/OPM-39 (A-4) (Front) SC phase coarse S102/OPM-39 (B-4) (Front)

For PAL

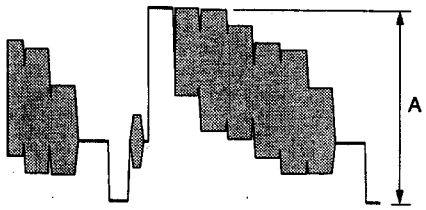
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Connect the PGM COMPOSITE connector to CH-A on the waveform monitor/vectorscope and select the BLACK input button. • Connect the REF. VIDEO connector to CH-B on the waveform monitor/vectorscope.		
STEP-2 • Vectorscope 75 % L.DISP: VECT INPUT: CH-A FILTER: FLAT GAIN: VAR REF: EXT	CH-A: PGM COMPOSITE <NG>  <OK>  A = 0 ±0.5° • Adjust the burst phase of a REF. VIDEO vectorscope waveform to 0° (counterclockwise) in CH-B. • Switch to the PGM COMPOSITE vectorscope waveform in CH-A and adjust S102 and RV103 so that the burst phase is 0°.	SC phase fine adjustment ● RV103/OPM-39P (A-4) (Front) SC phase coarse S102/OPM-39P (B-4) (Front)

4-3-29. PVW OUT Video Gain Adjustment

For NTSC

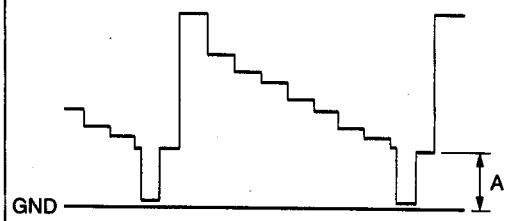
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 2 µs/DIV TRIG: B.B (CH4)	PVW OUT  A = 1000 ±10 mV p-p	PVW OUT gain adjustment ● RV801/OPM-39 (K-4)

For PAL

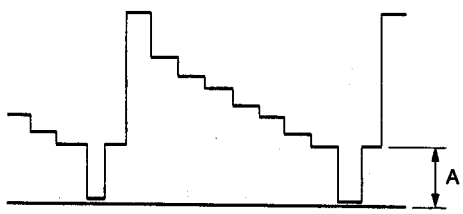
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 •Connection: Refer to Section 4-2. •Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100mV/DIV 2 µs/DIV TRIG: B.B (CH4)	PVW OUT  A = 1000 ±10 mV p-p	PVW OUT gain adjustment ● RV801/OPM-39P (K-4)

4-3-30. DSK EXT Key Clamp Level Adjustment

For NTSC

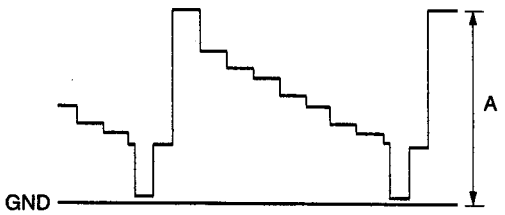
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732. • DSK KEY IN signal setting: 75 % color bars = 700 mV p-p (Y only) • Switch settings: S201/OPM-39 (E-2): SELF		
STEP-2 • Oscilloscope CH1: 500 mV/DIV TIME: 10 µs/DIV	 A = 730 ±10 mV dc	DSK EXT key clamp level adjustment ● RV202/OPM-39 (E-2): TP201/OPM-39 (E-2)

For PAL

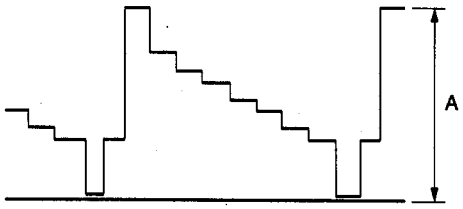
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732. • DSK KEY IN signal setting: 75 % color bars = 700 mV p-p (Y only) • Switch settings: S201/OPM-39P (E-2): SELF		
STEP-2 • Oscilloscope CH1: 500 mV/DIV TIME: 10 µs/DIV	 A = 730 ±10 mV dc	DSK EXT key clamp level adjustment ● RV202/OPM-39P (E-2): TP201/OPM-39P (E-2)

4-3-31. DSK EXT Key Gain Adjustment

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39 board with an extension board EX-732. • DSK KEY IN signal setting: 75 % color bars = 700 mV p-p (Y only) • Switch settings: S201/OPM-39 (E-2): SELF		
STEP-2 • Oscilloscope CH1: 500 mV/DIV TIME: 10 µs/DIV	 A = 2450 ±10 mV dc	DSK EXT key gain adjustment ● RV201/OPM-39 (E-2): TP201/OPM-39 (E-2)

For PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P board with an extension board EX-732. • DSK KEY IN signal setting: 75 % color bars = 700 mV p-p (Y only) • Switch settings: S201/OPM-39P (E-2): SELF		
STEP-2 • Oscilloscope CH1: 500 mV/DIV TIME: 10 µs/DIV	 A = 2450 ±10 mV dc	DSK EXT key gain adjustment ● RV201/OPM-39P (E-2): TP201/OPM-39P (E-2)

4-4. IPM-96/96P Board Adjustment

4-4-1. SDI VCO Free-running Frequency Adjustment

For NTSC/PAL

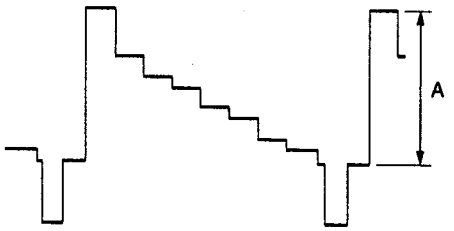
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96/96P board with an extension board EX-732. • Switch setting: S901/IPM-96 (G-9): ON S904/IPM-96/96P (J-9): ON S1001/IPM-96/96P (K-9): ON S1002/IPM-96/96P (L-9): ON		
STEP-2 • Frequency counter	• Specification: 27.00 ±0.27 MHz	Free-running frequency adjustment (NISC) ⊘ RV901/IPM-96 (G-9): TP901/IPM-96 (F-8) ⊘ RV902/IPM-96 (J-9): TP902/IPM-96 (G-8) ⊘ RV1001/IPM-96 (K-9): TP1001/IPM-96 (J-8) ⊘ RV1002/IPM-96 (L-9): TP1002/IPM-96 (K-8) (PAL) ⊘ RV901/IPM-96P(G-9): TP901/IPM-96P (F-8) ⊘ RV902/IPM-96P (J-9): TP902/IPM-96P (G-8) ⊘ RV1001/IPM-96P (K-9): TP1001/IPM-96P (J-8) ⊘ RV1002/IPM-96P (L-9): TP1002/IPM-96P (K-8)
STEP-3 • After completing the adjustment, set the switches S901 (G-9), S904(J-9), S1001 (K-9), and S1002 (L-9) on the IPM-96/96P board to OFF.		

4-4-2. Component Y Level Adjustment

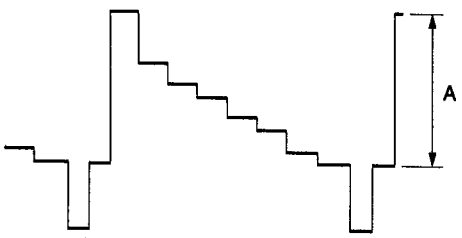
Note

Perform this adjustment after completing all the adjustments for the OPM-39/39P board.

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96 board with an extension board EX-732. • Test signal: 75 %, color bars • Control panel setting: BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5/1, 6/2, 7/3, or 8/4.)		
STEP-2 • Waveform monitor INPUT: CH-B1 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT Y)  A = 714 ±5 mV p-p	Component Y level adjustment ● RV105/IPM-96 (C-8): INPUT 5/1 ● RV305/IPM-96 (C-6): IINPUT 6/2 ● RV505/IPM-96 (C-4): INPUT 7/3 ● RV705/IPM-96 (C-1): INPUT 8/4

For PAL

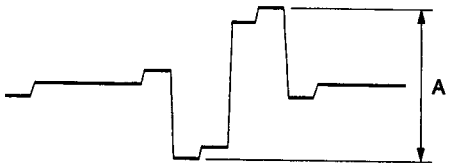
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96P board with an extension board EX-732. • Test signal: 75 %, color bars • Control panel setting: BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5/1, 6/2, 7/3, or 8/4.)		
STEP-2 • Waveform monitor INPUT: CH-B1 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT Y)  A = 700 ±5 mV p-p	Component Y level adjustment ● RV105/IPM96P (C-8): INPUT 5/1 ● RV305/IPM96P (C-6): IINPUT 6/2 ● RV505/IPM96P (C-4): INPUT 7/3 ● RV705/IPM96P (C-1): INPUT 8/4

4-4-3. Component Chroma Level Adjustment

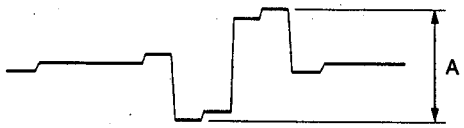
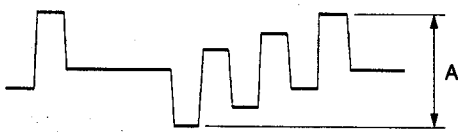
Note

Perform this adjustment after completing all the adjustments for the OPM-39/39P board.

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96 board with an extension board EX-732. • Test signal: 75 % color bars • Control panel setting: BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5/1, 6/2, 7/3, or 8/4.)		
STEP-2 • Waveform monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT R-Y)  A = 700 ±5 mV p-p	Component Chroma R-Y level adjustment ● RV103/IPM-96 (B-9): INPUT 5/1 ● RV303/IPM-96 (B-7): IINPUT 6/2 ● RV503/IPM-96 (B-4): INPUT 7/3 ● RV703/IPM-96 (B-2): INPUT 8/4
STEP-3 • Waveform monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT B-Y) A = 700 ±5 mV p-p	Component Chroma B-Y level adjustment ● RV104/IPM-96 (B-9): INPUT 5/1 ● RV304/IPM-96 (B-7): IINPUT 6/2 ● RV504/IPM-96 (B-4): INPUT 7/3 ● RV704/IPM-96 (B-2): INPUT 8/4

For PAL

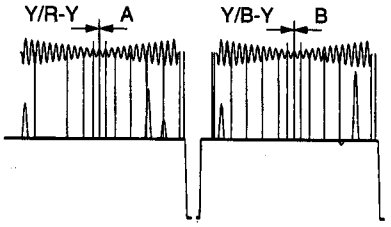
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96P board with an extension board EX-732. • Test signal: 75 % color bars • Control panel setting: BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5/1, 6/2, 7/3, or 8/4.)		
STEP-2 • Waveform monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT R-Y)  A = 525 ±5 mV p-p	Component chroma level adjustment ● RV103/IPM-96P (B-9): INPUT 5/1 ● RV303/IPM-96P (B-7): IINPUT 6/2 ● RV503/IPM-96P (B-4): INPUT 7/3 ● RV703/IPM-96P (B-2): INPUT8/4
STEP-2 • Waveform monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT B-Y)  A = 525 ±5 mV p-p	Component chroma B-Y level adjustment ● RV104/IPM-96P (B-9): INPUT 5/1 ● RV304/IPM-96P (B-7): IINPUT 6/2 ● RV504/IPM-96P (B-4): INPUT 7/3 ● RV704/IPM-96P (B-2): INPUT 8/4

4-4-4. Input Y/C Delay Adjustment

Note

Perform this adjustment after completing all the adjustments for the OPM-39/39P boards.

For NTSC/PAL

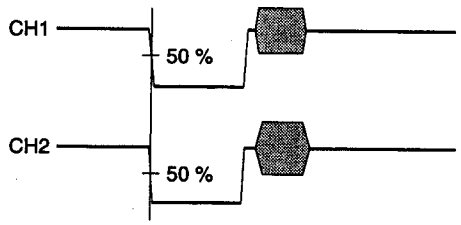
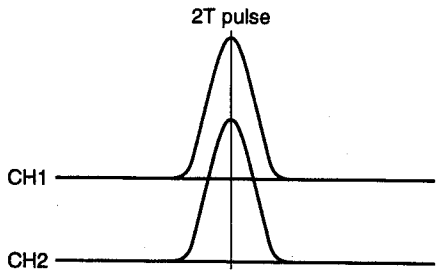
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96/96P board with an extension board EX-732. • Test signal: BOWTIE • Control panel setting: BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5/1, 6/2, 7/3, or 8/4.)		
STEP-2 • Waveform monitor MEASURE: BOWTIE INPUT: CH-B1 (COMPONENT Y) CH-B2 (COMPONENT R-Y) CH-B3 (COMPONENT B-Y) MODE: WAVEFORM REF: EXT	CH-B1: PGM OUT (COMPONENT Y) CH-B2: PGM OUT (COMPONENT R-Y) CH-B3: PGM OUT (COMPONENT B-Y)  A = 0 ±20 ns B = 0 ±20 ns • Set the each BOWTIE DIP point A and B on the center marker.	Y/R-Y delay adjustment (NTSC) ● RV101/IPM-96 (B-9): INPUT 5/1 ● RV301/IPM-96 (B-7): INPUT 6/2 ● RV501/IPM-96 (B-5): INPUT 7/3 ● RV701/IPM-96 (B-2): INPUT 8/4 (PAL) ● RV101/IPM-96P (B-9): INPUT 5/1 ● RV301/IPM-96P (B-7): INPUT 6/2 ● RV501/IPM-96P (B-5): INPUT 7/3 ● RV701/IPM-96P (B-2): INPUT 8/4 Y/B-Y delay adjustment (NTSC) ● RV102/IPM-96 (B-9): INPUT 5/1 ● RV302/IPM-96 (B-7): INPUT 6/2 ● RV502/IPM-96 (B-5): INPUT 7/3 ● RV702/IPM-96 (B-2): INPUT 8/4 (PAL) ● RV102/IPM-96P (B-9): INPUT 5/1 ● RV302/IPM-96P (B-7): INPUT 6/2 ● RV502/IPM-96P (B-5): INPUT 7/3 ● RV702/IPM-96P (B-2): INPUT 8/4

4-4-5. Video Input Phase Adjustment

Note

Perform this adjustment after completing all the adjustments for the OPM-39/39P board.

For NTSC/PAL

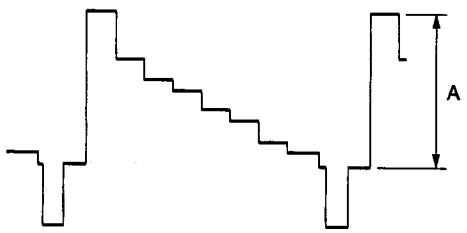
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96/96P board with an extension board EX-732. • Test signal: Pulse and bar (2T pulse) • Control panel setting: BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5/1, 6/2, 7/3, or 8/4.)		
STEP-2 • Oscilloscope CH1: 200 mV/DIV 2 µs/DIV CH2: 200 mV/DIV 2 µs/DIV TRIG: B.B (CH4)	CH1: COMPONENT Y IN 5/1, 6/2, 7/3, 8/4 CH2: PGM OUT (COMPONENT Y)  • Check that D101/OPM-39/39P (A-6) lights up. • Check that INPUT COMPONENT Y SYNC and RGM OUT (COMPONENT Y) SYNC have the same phase.	(Check)
STEP-3 • Oscilloscope CH1: 200 mV/DIV 2 ns/DIV CH2: 200 mV/DIV 2 ns/DIV TRIG: B.B (CH4)	CH1: COMPONENT Y IN 5/1, 6/2, 7/3, 8/4 CH2: PGM OUT (COMPONENT Y)  • Check that D101/OPM-39/39P (A-6) lights up. • Adjust so that INPUT COMPONENT Y 2T pulse and RGM OUT (COMPONENT Y) 2T pulse have the same phase.	Input video phase adjustment (NTSC) ● RV201/IPM-96 (F-8): INPUT 5/1 ● RV401/IPM-96 (F-6): INPUT 6/2 ● RV601/IPM-96 (F-4): INPUT 7/3 ● RV801/IPM-96 (F-1): INPUT 8/4 (PAL) ● RV201/IPM-96P (F-8): INPUT 5/1 ● RV401/IPM-96P (F-6): INPUT 6/2 ● RV601/IPM-96P (F-4): INPUT 7/3 ● RV801/IPM-96P (F-1): INPUT 8/4

4-4-6. RGB Converted Y Level Adjustment

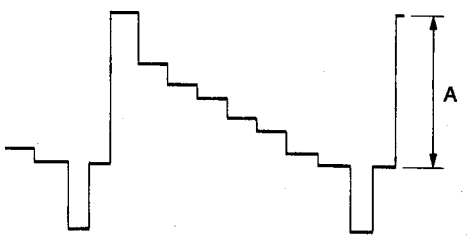
Note

Perform this adjustment after completing all the adjustments for the OPM-39/39P board and "4-4-2. Component Y Level Adjustment".

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96 board with an extension board EX-732. • Test signal: 75 % color bars (GBR format) • Control panel setting: 1. BACKGROUND bus: Select input 8. (Used for input 8/4.) 2. Setup: Select input 8. (RGB)		
STEP-2 • Waveform monitor INPUT: CH-B1 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT Y)  A = 714 ±5 mV p-p	RGB converted level adjustment ● RV706/IPM-96 (A-3)

For PAL

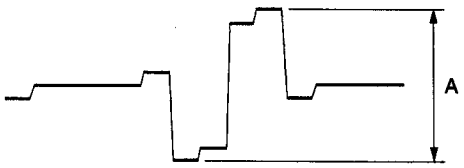
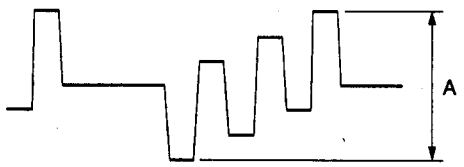
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96P board with an extension board EX-732. • Test signal: 75 % color bars (GBR format) • Control panel setting: 1. BACKGROUND bus: Select input 8. (Used for input 8/4.) 2. Setup: Select input 8. (RGB)		
STEP-2 • Waveform monitor INPUT: CH-B1 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT Y)  A = 700 ±5 mV p-p	RGB converted level adjustment ● RV706/IPM-96P (A-3)

4-4-7. RGB Converted Chroma Level Adjustment

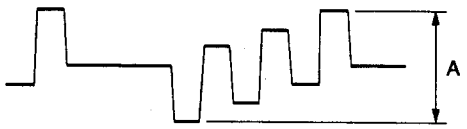
Note

Perform this adjustment after completing all the adjustments for the OPM-39/39P board and "4-4-3. Component Chroma Level Adjustment".

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2 • Extension board: Extend the IPM-96 board with an extension board EX-732. • Test signal: 75 % color bars (GBR format) • Control panel setting: 1. BACKGROUND bus: Select input 8. (Used for input 8/4.) 2. Setup: Select input 8. (RGB)		
STEP-2 • Waveform monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT R-Y)  A = 700 ±5 mV p-p	RGB converted chroma R-Y level adjustment ⊘ RV707/IPM-96 (A-3)
STEP-3 • Waveform monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT B-Y)  A = 700 ±5 mV p-p	RGB converted chroma level adjustment ⊘ RV708/IPM-96 (B-3)

For PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2 • Extension board: Extend the IPM-96P board with an extension board EX-732. • Test signal: 75 % color bars (GBR format) • Control panel setting: 1. BACKGROUND bus: Select input 8. (Used for input 8/4.) 2. Setup: Select input 8. (RGB)		
STEP-2 • Waveform monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT R-Y) A = 525 ±5 mV	RGB converted chroma R-Y level adjustment ⊘ RV707/IPM-96P (A-3)
STEP-3 • Waveform monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT B-Y)  A = 525 ±5 mV	RGB converted chroma B-Y level adjustment ⊘ RV708/IPM-96P (B-3)

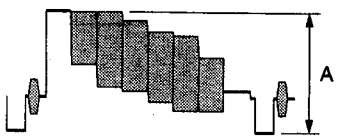
4-5. VIF-19/19P Board Adjustment

4-5-1. Composite Y Level Adjustment

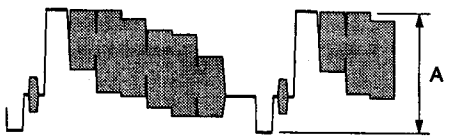
Note

Perform this adjustment after completing all the adjustments for the OPM-39/39P board.

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19 board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 (L-4): ON (UC) • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)		
STEP-2 • Oscilloscope CH1: 500 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	CH1: TP201/VIF-19 (H-8) CH1: TP501/VIF-19 (F-8) CH1: TP801/VIF-19 (D-8) CH1: TP1101/VIF-19 (B-8)  A=1.55 V p-p	Component Y level adjustment ● RV102/VIF-19 (J-8): ● RV402/VIF-19 (G-8): ● RV702/VIF-19 (E-8): ● RV1002/VIF-19 (B-8):

For PAL

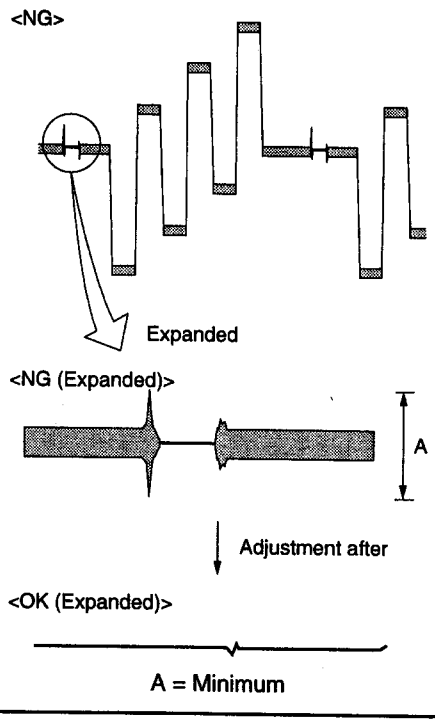
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19P board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39P (L-4): OFF • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)		
STEP-2 • Oscilloscope CH1: 500 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	CH1: TP201/VIF-19P (H-8) CH1: TP501/VIF-19P (F-8) CH1: TP801/VIF-19P (D-8) CH1: TP1101/VIF-19P (B-8)  A=1.55 V p-p	Component Y level adjustment ● RV102/VIF-19P (J-8): ● RV402/VIF-19P (G-8): ● RV702/VIF-19P (E-8): ● RV1002/VIF-19P (B-8):

4-5-2. S VIDEO Clamp DC Level Adjustment

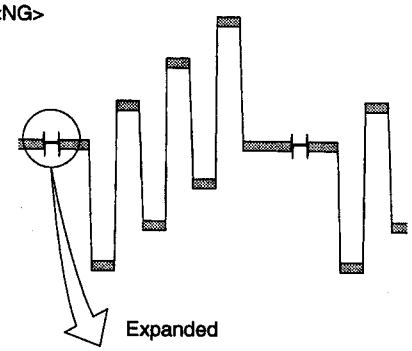
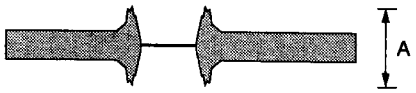
Note

Perform this adjustment after completing all the adjustments for OPM-39/39P board.

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19 board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 (L-4): ON (NTSC <UC>) • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (YC) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 S VIDEO)		
STEP-2 • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) CH1: 50 mV/DIV 2 µs/DIV TRIG: B.B (CH4)		Clamp DC adjustment ●RV104/VIF-19 (J-9): TP203/VIF-19 (H-4) ●RV404/VIF-19 (G-9): TP503/VIF-19 (F-4) ●RV704/VIF-19 (E-9): TP803/VIF-19 (D-4) ●RV1004/VIF-19 (C-9): TP1103/VIF-19(B-4)

For PAL

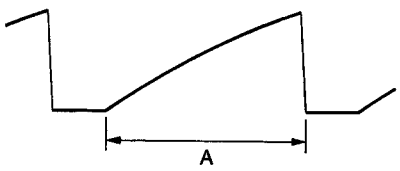
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19P board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39P (L-4): OFF (PAL) • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom several times and set it at the top. 3. Setup: Select inputs 5 to 8 (YC) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 S VIDEO)		
STEP-2 • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) CH1: 50 mV/DIV 2 µs/DIV TRIG: B.B (CH4)	<NG>  <NG (Expanded)>  Adjustment after <OK (Expanded)> A = Minimum	Clamp DC adjustment ●RV104/VIF-19P (J-9): TP203/VIF-19P (H-4) ●RV404/VIF-19P (G-9): TP503/VIF-19P (F-4) ●RV704/VIF-19P (E-9): TP803/VIF-19P (D-4) ●RV1004/VIF-19P (C-9): TP1103/VIF-19P (B-4)

4-5-3. SYNC Separate Adjustment

Note

Perform this adjustment after completing all the adjustments for OPM-39/39P board.

For NTSC/PAL

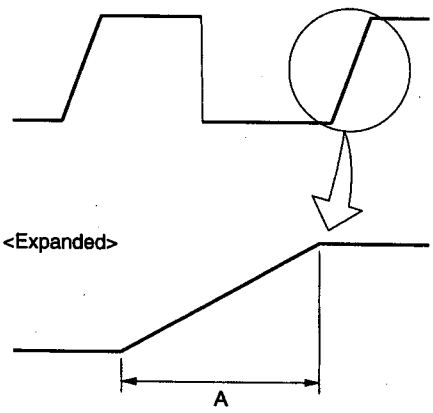
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19/19P board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 (L-4): ON (NTSC <UC>) S801-1/OPM-39P (L-4): OFF (PAL) • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)		
STEP-2 • Oscilloscope CH1: 1 V/DIV 10 µs/DIV TRIG: B.B (CH4)	CH1: TP301/VIF-19,19P (G-8) CH1: TP601/VIF-19,19P (E-8) CH1: TP901/VIF-19,19P (C-8) CH1: TP1201/VIF-19,19P (A-8)  A = 50 µs	SYNC separate adjustment (NTSC) ●RV301/VIF-19(G-7) ●RV601/VIF-19(E-7) ●RV901/VIF-19(C-7) ●RV1201/VIF-19 (A-7) (PAL) ●RV301/VIF-19P (G-7) ●RV601/VIF-19P (E-7) ●RV901/VIF-19P (C-7) ●RV1201/VIF-19P (A-7)

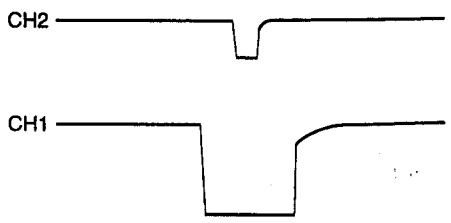
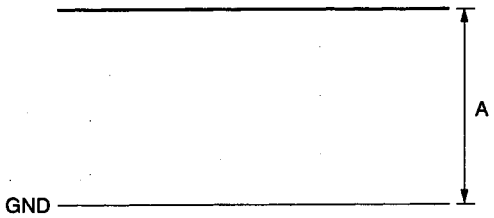
4-5-4. H Lock Loop Adjustment

Note

Perform this adjustment after completing all the adjustments for OPM-39/39P board.

For NTSC/PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19/19P board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 (L-4): ON (NTSC <UC>) S801-1/OPM-39P (L-4): OFF (PAL) • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)		
STEP-2 • Oscilloscope CH1: 2 V/DIV 2 µs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) CH1: 2 V/DIV 2 µs/DIV TRIG: B.B (CH4) (Continued to STEP-3 on the next page.)	TP302/VIF-19, 19P (H-6) TP602/VIF-19, 19P (F-6) TP902/VIF-19, 19P (D-6) TP1202/VIF-19, 19P (B-6)  A = 9.4 µs	Sawtooth slope adjustment (NTSC) ●RV302/VIF-19 (H-5) ●RV602/VIF-19 (F-5) ●RV902/VIF-19 (D-5) ●RV1202/VIF-19 (B-5) (PAL) ●RV302/VIF-19P (H-5) ●RV602/VIF-19P (F-5) ●RV902/VIF-19P (D-5) ●RV1202/VIF-19P (B-5)

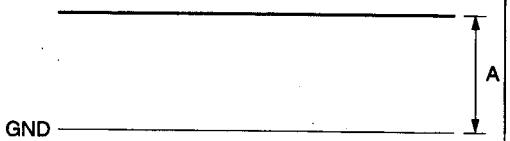
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-3 • Oscilloscope CH1: 5 V/DIV 500 ns/DIV CH2: 2 V/DIV 500 ns/DIV TRIG: B.B (CH4)	CH1: CH2: TP306/VIF-19,19P (H-7) TP303/VIF-19,19P (G-6) TP606/VIF-19,19P (F-7) TP603/VIF-19,19P (E-6) TP906/VIF-19,19P (D-7) TP903/VIF-19,19P (C-6) TP1206/VIF-19,19P (B-7) TP1203/VIF-19,19P (A-6)  • Adjust so that the waveform in CH2 is almost in the center of CH1.	Sample pulse phase adjustment (NTSC) ⊘RV303/VIF-19 (H-5) ⊘RV603/VIF-19 (F-5) ⊘RV903/VIF-19 (D-5) ⊘RV1203/VIF-19 (A-5) (PAL) ⊘RV303/VIF-19P (H-5) ⊘RV603/VIF-19P (F-5) ⊘RV903/VIF-19P (D-5) ⊘RV1203/VIF-19P (A-5)
STEP-4 • Digital voltmeter	TP305/VIF-19/19P (G-6) TP605/VIF-19/19P (E-6) TP905/VIF-19/19P (C-6) TP1205/VIF-19/19P (A-6)  A = 2.5 V dc	VFO BIAS adjustment (NTSC) ⊘LV301/VIF-19 (H-4) ⊘LV601/VIF-19 (F-4) ⊘LV901/VIF-19 (D-4) ⊘LV1201/VIF-19 (A-4) (PAL) ⊘LV301/VIF-19P (H-4) ⊘LV601/VIF-19P (F-4) ⊘LV901/VIF-19P (D-4) ⊘LV1201/VIF-19P (A-4)

4-5-5. Burst Delay Adjustment

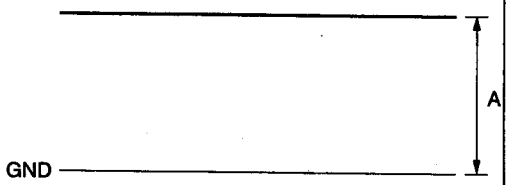
Note

Perform this adjustment after completing all the adjustments for OPM-39/39P board.

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19 board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 (L-4): ON (UC) • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)		
STEP-2 • Digital voltmeter	TP103/VIF-19 (H-9) TP403/VIF-19 (F-9) TP703/VIF-19 (C-9) TP1003/VIF-19 (A-9)  A = 1.5 V dc	Burst delay adjustment ⊘RV101/VIF-19 (H-9) ⊘RV401/VIF-19 (F-9) ⊘RV701/VIF-19 (D-9) ⊘RV1001/VIF-19 (B-9)

For PAL

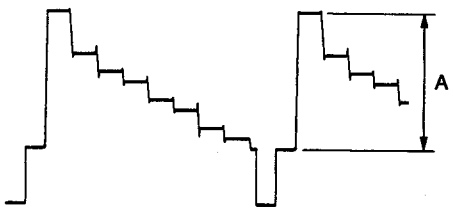
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19P board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39P (L-4): OFF • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)		
STEP-2 • Digital voltmeter	TP103/VIF-19P (H-9) TP403/VIF-19P (F-9) TP703/VIF-19P (C-9) TP1003/VIF-19P (A-9)  A = 2.0 V dc	Burst delay adjustment ⊘RV101/VIF-19P (H-9) ⊘RV401/VIF-19P (F-9) ⊘RV701/VIF-19P (D-9) ⊘RV1001/VIF-19P (B-9)

4-5-6. Composite Input Y Gain Adjustment

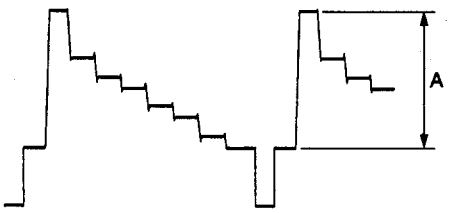
Note

Perform this adjustment after completing all the adjustments for OPM-39/39P board.

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19/19P board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 (L-4): ON (UC) • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)		
STEP-2 • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT Y)  A = 714 ±7 mV	Y gain adjustment ●RV201/VIF-19 (H-4) ●RV501/VIF-19 (F-4) ●RV801/VIF-19 (D-4) ●RV1101/VIF-19 (B-4)

For PAL

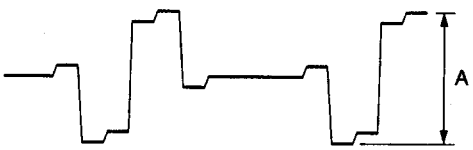
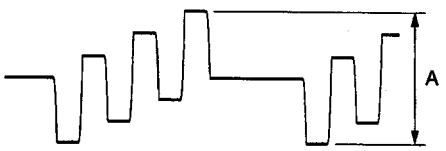
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19P board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39P (L-4): OFF • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)		
STEP-2 • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT Y)  A = 700 ±7 mV	Y gain adjustment ⊘RV201/VIF-19P (H-4) ⊘RV501/VIF-19P (F-4) ⊘RV801/VIF-19P (D-4) ⊘RV1101/VIF-19P (B-4)

4-5-7. Composite Input Chroma Level Adjustment

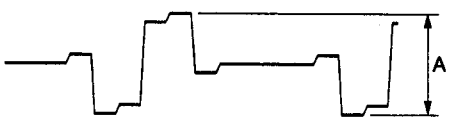
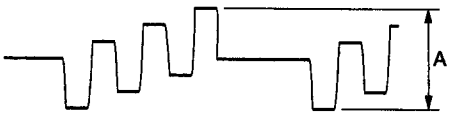
Note

Perform this adjustment after completing all the adjustments for OPM-39/39P board.

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19 board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 (L-4): ON (UC) • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)		
STEP-2 • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT R-Y)  A = 700 ±7 mV	R-Y level adjustment ●RV207/VIF-19 (J-4) ●RV507/VIF-19 (G-4) ●RV807/VIF-19 (E-4) ●RV1107/VIF-19 (C-4)
STEP-3 • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT B-Y)  A = 700 ±7 mV	B-Y level adjustment ●RV206/VIF-19 (H-4) ●RV506/VIF-19 (F-4) ●RV806/VIF-19 (D-4) ●RV1106/VIF-19 (B-4)

For PAL

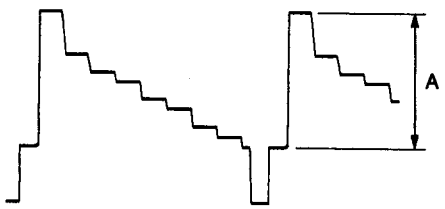
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19P board with an extension board EX-732. • Test signal: 75 % color bars S801-1/OPM-39P (L-4): OFF • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)		
STEP-2 • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT R-Y)  A = 525 ±5 mV	R-Y level adjustment ●RV207/VIF-19P (J-4) ●RV507/VIF-19P (G-4) ●RV807/VIF-19P (E-4) ●RV1107/VIF-19P (C-4)
STEP-3 • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT B-Y)  A = 525 ±5 mV	B-Y level adjustment ●RV206/VIF-19P (H-4) ●RV506/VIF-19P (F-4) ●RV806/VIF-19P (D-4) ●RV1106/VIF-19P (B-4)

4-5-8. S VIDEO Input Gain Adjustment

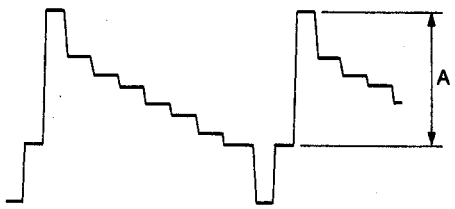
Note

Perform this adjustment after completing all the adjustments for OPM-39/39P board.

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19 board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 (L-4): ON (UC) • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (YC) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 S VIDEO)		
STEP-2 • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT Y)  A = 714 ±7 mV	Y gain adjustment ●RV103/VIF-19 (J-9) ●RV403/VIF-19 (G-9) ●RV703/VIF-19 (E-9) ●RV1003/VIF-19 (C-9)

For PAL

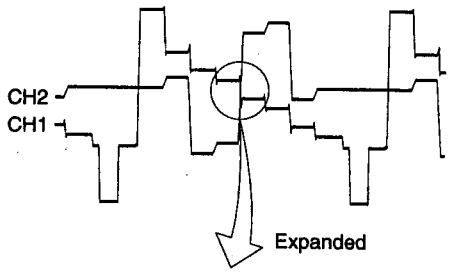
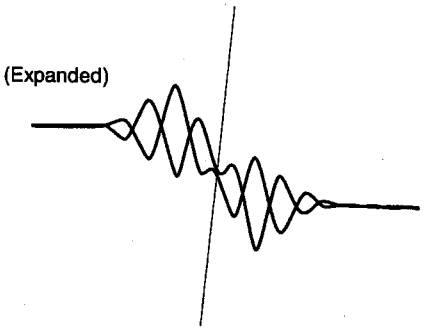
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19P board with an extension board EX-732. • Test signal: 75 % color bars S801-1/OPM-39P (L-4): OFF • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (YC) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 S VIDEO)		
STEP-2 • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT Y)  A = 700 ±7 mV	Y gain adjustment ●RV103/VIF-19P (J-9) ●RV403/VIF-19P (G-9) ●RV703/VIF-19P (E-9) ●RV1003/VIF-19P (C-9)

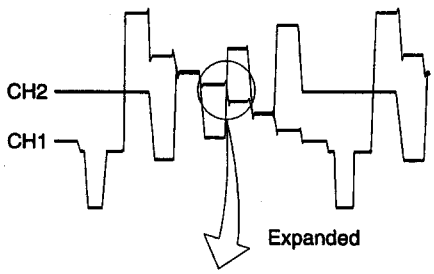
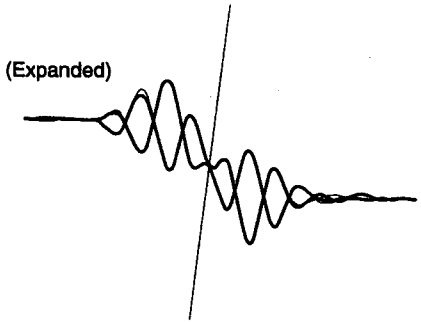
4-5-9. Composite Input Y/C Delay Adjustment

Note

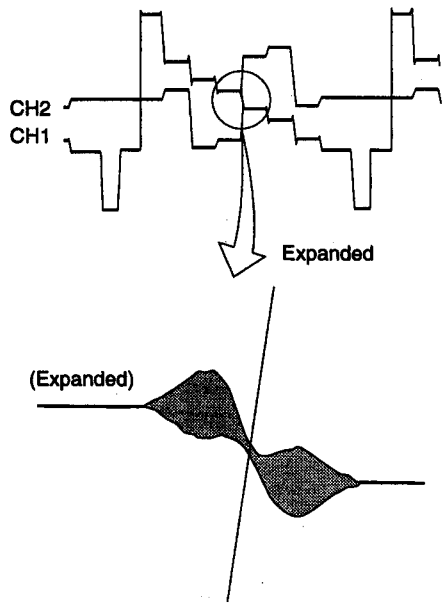
Perform this adjustment after completing all the adjustments for OPM-39/39P board.

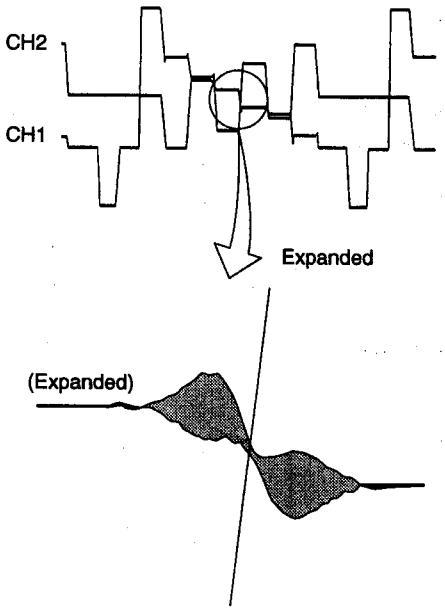
For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19 board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 (L-4): ON (UC) • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)		
STEP-2 • Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis. • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV CH2: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) CH1: 50 mV/DIV 200 ns/DIV CH2: 20 mV/DIV 200 ns/DIV TRIG: B.B (CH4) (Continued to STEP-3 on the next page.)	CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT R-Y)  (Expanded)  • Adjust so that the phases of the Y and R-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.)	Y/R-Y DL adjustment ●RV205/VIF-19 (J-4) ●RV505/VIF-19 (G-4) ●RV805/VIF-19 (E-4) ●RV1105/VIF-19 (C-4)

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-3 • Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis. • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV CH2: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) CH1: 50 mV/DIV 200 ns/DIV CH2: 20 mV/DIV 200 ns/DIV TRIG: B.B (CH4)	CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT B-Y)   • Adjust so that the phases of the Y and B-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.)	Y/B-Y DL adjustment ⊘RV203/VIF-19 (J-4) ⊘RV503/VIF-19 (G-4) ⊘RV803/VIF-19 (D-4) ⊘RV1103/VIF-19 (B-4)

For PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19P board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39P (L-4): OFF • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 S VIDEO)		
STEP-2 • Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis. • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV CH2: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) CH1: 50 mV/DIV 200 ns/DIV CH2: 20 mV/DIV 200 ns/DIV TRIG: B.B (CH4) (Continued to STEP-3 on the next page.)	CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT R-Y)  • Adjust so that the phases of the Y and R-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.)	Y/R-Y DL adjustment ●RV205/VIF-19P (J-4) ●RV505/VIF-19P (G-4) ●RV805/VIF-19P (E-4) ●RV1105/VIF-19P (C-4)

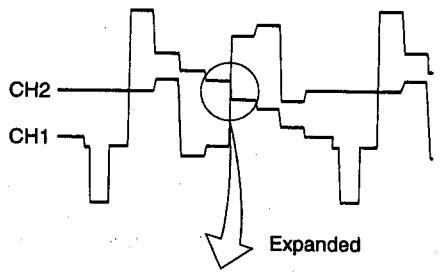
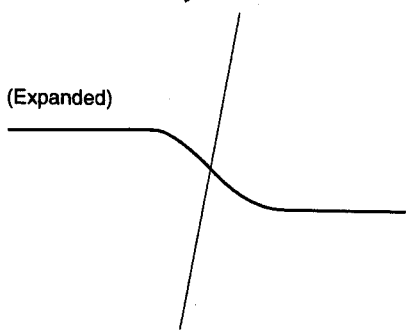
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-3 • Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis. • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV CH2: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) CH1: 50 mV/DIV 200 ns/DIV CH2: 20 mV/DIV 200 ns/DIV TRIG: B.B (CH4)	CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT B-Y)  • Adjust so that the phases of the Y and B-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.)	Y/B-Y DL adjustment ●RV203/VIF-19P (J-4) ●RV503/VIF-19P (G-4) ●RV803/VIF-19P (D-4) ●RV1103/VIF-19P (B-4)

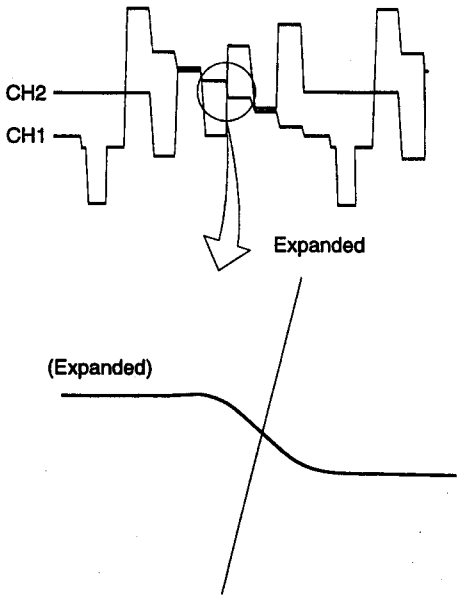
4-5-10. S VIDEO Input Y/C Delay Adjustment

Note

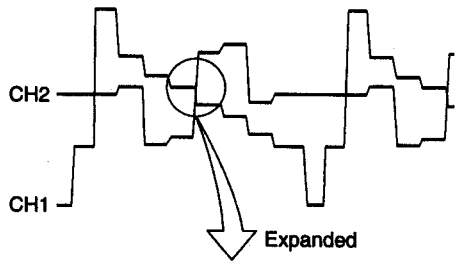
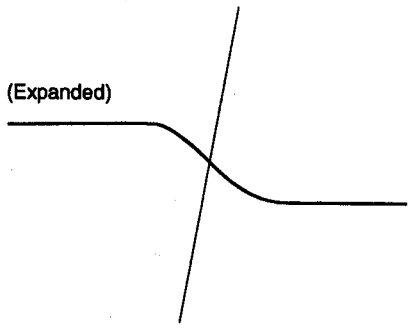
Perform this adjustment after completing all the adjustments for OPM-39/39P board.

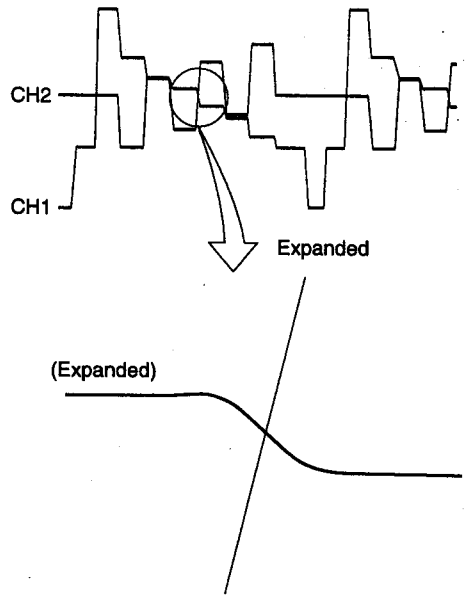
For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19 board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 (L-4): ON (UC) • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (YC) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 S VIDEO)		
STEP-2 • Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis. • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV CH2: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) CH1: 50 mV/DIV 200 ns/DIV CH2: 20 mV/DIV 200 ns/DIV TRIG: B.B (CH4) (Continued to STEP-3 on the next page.)	CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT R-Y)   • Adjust so that the phases of the Y and R-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.)	Y/R-Y DL adjustment ●RV204/VIF-19 (J-4) ●RV504/VIF-19 (G-4) ●RV804/VIF-19 (E-4) ●RV1104/VIF-19 (C-4)

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-3 • Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis. • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV CH2: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) CH1: 50 mV/DIV 200 ns/DIV CH2: 20 mV/DIV 200 ns/DIV TRIG: B.B (CH4)	CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT B-Y)  • Adjust so that the phases of the Y and B-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.)	Y/B-Y DL adjustment ●RV202/VIF-19 (J-4) ●RV502/VIF-19 (G-4) ●RV802/VIF-19 (D-4) ●RV1102/VIF-19 (B-4)

For PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19P board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39P (L-4): OFF • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (YC) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 S VIDEO)		
STEP-2 • Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis. • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV CH2: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) CH1: 50 mV/DIV 200 ns/DIV CH2: 20 mV/DIV 200 ns/DIV TRIG: B.B (CH4) (Continued to STEP-3 on the next page.)	CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT R-Y)   • Adjust so that the phases of the Y and R-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.)	Y/R-Y DL adjustment ●RV204/VIF-19P (J-4) ●RV504/VIF-19P (G-4) ●RV804/VIF-19P (E-4) ●RV1104/VIF-19P (C-4)

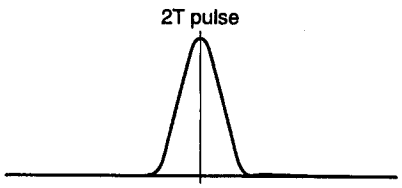
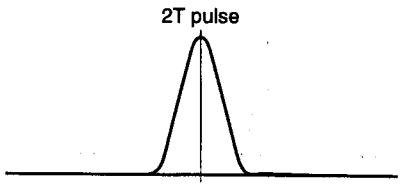
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-3 • Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis. • Oscilloscope CH1: 200 mV/DIV 10 µs/DIV CH2: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) CH1: 50 mV/DIV 200 ns/DIV CH2: 20 mV/DIV 200 ns/DIV TRIG: B.B (CH4)	CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT B-Y)  • Adjust so that the phases of the Y and B-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.)	Y/B-Y DL adjustment ●RV202/VIF-19P (J-4) ●RV502/VIF-19P (G-4) ●RV802/VIF-19P (D-4) ●RV1102/VIF-19P (B-4)

4-5-11. Video Input Phase Adjustment

Note

Perform this adjustment after completing all the adjustments for OPM-39/39P board.

For NTSC/PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19/19P board with an extension board EX-732. • Test signal: Pulse, bars • Switch setting: S801-1/OPM-39 (L-4): ON (NTSC <UC>) S801-1/OPM-39P (L-4): OFF (PAL) • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8(Input 5, 6, 7, 8 S VIDEO)		
STEP-2 • Oscilloscope CH1: 200 mV/DIV 200 ns/DIV TRIG: CH1	CH1: COMPOSITE IN 5, 6, 7, 8  CH1: PGM OUT (COMPONENT Y)  • Adjust so that INPUT COMPOSITE 2T pulse and PGM OUT (component Y) 2T pulse have the same phase.	Input Video Phase adjustment (NTSC) ●RV303/VIF-19 (H-5) ●RV603/VIF-19 (F-5) ●RV903/VIF-19 (D-5) ●RV1203/VIF-19 (A-5) (PAL) ●RV303/VIF-19P (H-5) ●RV603/VIF-19P (F-5) ●RV903/VIF-19P (D-5) ●RV1203/VIF-19P (A-5)

4-6. VIF-20/20P Board Adjustment

4-6-1. SDI VCO Free-running Frequency Adjustment

For NTSC/PAL

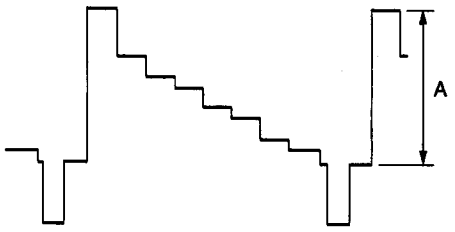
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-20/20P board with an extension board EX-732. • Switch setting: S901/VIF-20, VIF-20P (G-9): ON S904/VIF-20, VIF-20P (J-9): ON S1001/VIF-20, VIF-20P (K-9): ON S1002/VIF-20, VIF-20P (L-9): ON		
STEP-2 • Frequency counter	• Specification: 27.00 ±0.27 MHz	Free-running frequency adjustment (NTSC) ⊘ RV901/VIF-20 (G-9): TP901/VIF-20 (F-10) ⊘ RV902/VIF-20 (J-9): TP902/VIF-20 (H-10) ⊘ RV1001/VIF-20 (K-9): TP1001/VIF-20 (J-10) ⊘ RV1002/VIF-20 (L-9): TP10021/VIF-20 (K-10) (PAL) ⊘ RV901/VIF-20P (G-9): TP901/VIF-20P (F-10) ⊘ RV902/VIF-20P (J-9): TP902/VIF-20P (H-10) ⊘ RV1001/VIF-20P (K-9): TP1001/VIF-20P (J-10) ⊘ RV1002/VIF-20P (L-9): TP10021/VIF-20P (K-10)
STEP-3 • After completing the adjustment, set the switches S901 (G-9), S904 (J-9), S1001 (K-9) and S1002 (L-9) on the VIF-20/20P board to OFF.		

4-6-2. Component Y Level Adjustment

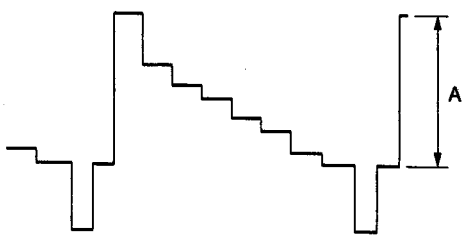
Note

Perform this adjustment after completing all the adjustments for the OPM-39/39P board.

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2 • Extension board: Extend the VIF-20 board with an extension board EX-732. • Test signal: 75 % color bars • Control panel setting: 1. BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5, 6, 7, or 8.) 2. Setup: Select inputs 5 to 8. (YUV)		
STEP-2 • (1) or (2) is used. (1) Waveform monitor INPUT: CH-B1 MODE:WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT Y)  A = 714 ±5 mV p-p	Component Y level adjustment ● RV103/VIF-20 (C-8): INPUT 5 ● RV303/VIF-20 (C-6): INPUT 6 ● RV503/VIF-20 (C-4): INPUT 7 ● RV703/VIF-20 (C-1): INPUT 8

For PAL

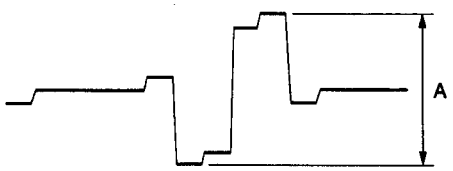
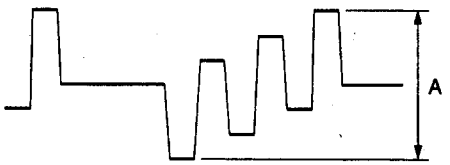
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-20P board with an extension board EX-732. • Test signal: 75 % color bars • Control panel setting: 1. BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5, 6, 7, or 8.) 2. Setup: Select inputs 5 to 8. (YUV)		
STEP-2 • (1) or (2) is used. (1) Waveform monitor INPUT: CH-B1 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT Y)  A = 700 ±5 mV p-p	Component Y level adjustment ● RV103/VIF-20P (C-8): INPUT 5 ● RV303/VIF-20P (C-6): INPUT 6 ● RV503/VIF-20P (C-4): INPUT 7 ● RV703/VIF-20P (C-1): INPUT 8

4-6-3. Component Chroma Level Adjustment

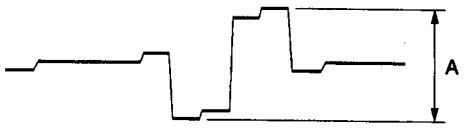
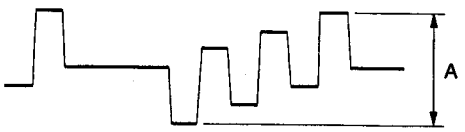
Note

Perform this adjustment after completing all the adjustments for OPM-39/39P board.

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-20 board with an extension board EX-732. • Test signal: 75 % color bars • Control panel setting: 1. BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5, 6, 7, or 8.) 2. Setup: Select inputs 5 to 8. (YUV)		
STEP-2 • (1) or (2) is used. (1) Waveform monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT R-Y)  A = 700 ±5 mV p-p	Component chroma R-Y level adjustment ● RV104/VIF-20 (B-9): INPUT 5 ● RV304/VIF-20 (B-7): INPUT 6 ● RV504/VIF-20 (B-4): INPUT 7 ● RV704/VIF-20 (B-2): INPUT 8
STEP-3 • (1) or (2) is used. (1) Waveform monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT B-Y)  A = 700 ±5 mV p-p	Component chroma B-Y level adjustment ● RV105/VIF-20 (B-10): INPUT 5 ● RV305/VIF-20 (B-7): INPUT 6 ● RV505/VIF-20 (B-5): INPUT 7 ● RV705/VIF-20 (B-3): INPUT 8

For PAL

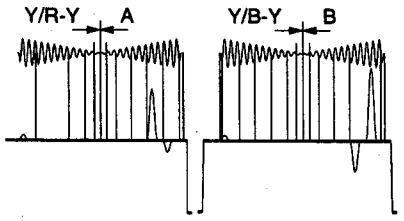
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-20P board with an extension board EX-732. • Test signal: 75 % color bars • Control panel setting: 1. BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5, 6, 7, or 8.) 2. Setup: Select inputs 5 to 8. (YUV)		
STEP-2 • (1) or (2) is used. (1) Waveform monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT R-Y)  A = 525 ±5 mV p-p	Component chroma R-Y level adjustment ● RV104/VIF-20P (B-9): INPUT 5 ● RV304/VIF-20P (B-7): INPUT 6 ● RV504/VIF-20P (B-4): INPUT 7 ● RV704/VIF-20P (B-2): INPUT 8
STEP-3 • (1) or (2) is used. (1) Waveform monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 µs/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT B-Y)  A = 525 ±5 mV p-p	Component chroma B-Y level adjustment ● RV105/VIF-20P (B-10): INPUT 5 ● RV305/VIF-20P (B-7): INPUT 6 ● RV505/VIF-20P (B-5): INPUT 7 ● RV705/VIF-20P (B-3): INPUT 8

4-6-4. Input Y/C Delay Adjustment

Note

Perform this adjustment after completing all the adjustments for OPM-39/39P board.

For NTSC/PAL

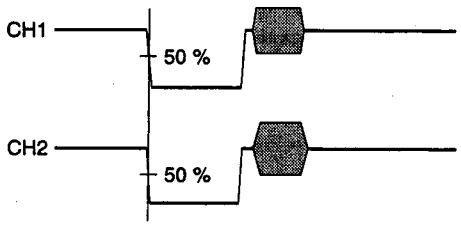
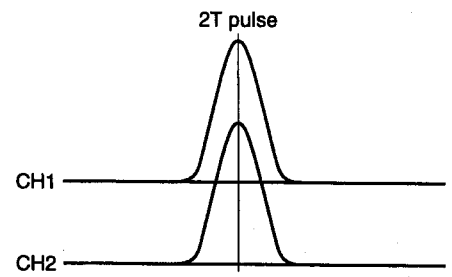
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-20/20P board with an extension board EX-732. • Test signal: BOWTIE • Control panel setting: 1. BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5, 6, 7, or 8.) 2. Setup: Select inputs 5 to 8. (YUV)		
STEP-2 • Waveform monitor MEASURE: BOWTIE INPUT: CH-B1 (COMPONENT Y) CH-B2 (COMPONENT R-Y) CH-B3 (COMPONENT B-Y) MODE: WAVEFORM REF: EXT	CH-B1: PGM OUT (COMPONENT Y) CH-B2: PGM OUT (COMPONENT R-Y) CH-B3: PGM OUT (COMPONENT B-Y)  A = 0 ±20 ns B = 0 ±20 ns • Set the BOWTIE DIP point A and B on the center marker.	Y/R-Y delay adjustment (NTSC) ● RV101/VIF-20 (B-9): INPUT 5 ● RV302/VIF-20 (B-7): INPUT 6 ● RV502/VIF-20 (B-4): INPUT 7 ● RV702/VIF-20 (B-2): INPUT 8 (PAL) ● RV101/VIF-20P (B-9): INPUT 5 ● RV302/VIF-20P (B-7): INPUT 6 ● RV502/VIF-20P (B-4): INPUT 7 ● RV702/VIF-20P (B-2): INPUT 8 Y/B-Y delay adjustment (NTSC) ● RV102/VIF-20 (B-9): INPUT 5 ● RV302/VIF-20 (B-7): INPUT 6 ● RV502/VIF-20 (B-5): INPUT 7 ● RV702/VIF-20 (B-3): INPUT 8 (PAL) ● RV102/VIF-20P (B-9): INPUT 5 ● RV302/VIF-20P (B-7): INPUT 6 ● RV502/VIF-20P (B-5): INPUT 7 ● RV702/VIF-20P (B-3): INPUT 8

4-6-5. Video Input Phase Adjustment

Note

Perform this adjustment after completing all the adjustments for OPM-39/39P board.

For NTSC/PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-20/20P board with an extension board EX-732. • Test signal: pulse, bar (2T pulse) • Control panel setting: 1. BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5, 6, 7, or 8.) 2. Setup: Select inputs 5 to 8. (YUV)		
STEP-2 H phase adjustment • Oscilloscope CH1: 200 mV/DIV 2 µ/DIV CH2: 200 mV/DIV 2 µ/DIV TRIG: B.B (CH4)	CH1: COMPONENT 5, 6, 7, 8 CH2: PGM OUT (COMPONENT Y)  • Check that D101/OPM-39 (A-6) lights up. • Check that INPUT COMPONENT Y SYNC and PGM OUT (COMPONENT Y) SYNC have the same phase.	(Check)
STEP-3 Video phase adjustment • Oscilloscope CH1: 200 mV/DIV 2 µ/DIV CH2: 200 mV/DIV 2 µ/DIV TRIG: B.B (CH4)	CH1: COMPONENT 5, 6, 7, 8 CH2: PGM OUT (COMPONENT Y)  • Check that D101/OPM-39 (A-6) lights up. • Adjust so that INPUT COMPONENT Y 2T pulse and PGM OUT (COMPONENT Y) 2T pulse have the same phase.	Video phase adjustment (NTSC) ● RV201/VIF-20 (F-8): INPUT 5 ● RV401/VIF-20 (F-6): INPUT 6 ● RV601/VIF-20 (F-4): INPUT 7 ● RV801/VIF-20 (F-1): INPUT 8 (PAL) ● RV201/VIF-20P (F-8): INPUT 5 ● RV401/VIF-20P (F-6): INPUT 6 ● RV601/VIF-20P (F-4): INPUT 7 ● RV801/VIF-20P (F-1): INPUT 8

4-7. Adjusting the Power Supply Voltage

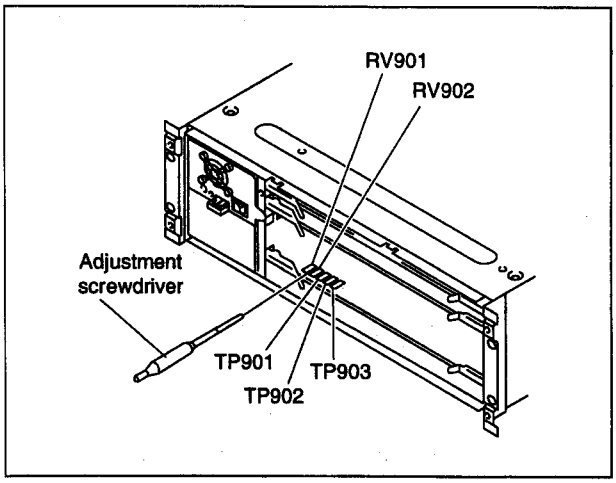
Note

When installing the unit, changing the board layout or replacing the power supply unit, be sure to adjust the power supply voltage.

Required equipment: Digital voltmeter

Adjustment

1. Remove the front panel. (Refer to Section 2-2.)
2. Remove the four screws and then remove the board stopper assembly. (Refer to Section 2-1-8.)
3. Connect the digital voltmeter to the GND terminal (TP903) and +5 V terminal (TP901) on the OPM-39/39P board.
4. Adjust the +3.3 V adjustment volume (⊘RV901) so that the voltage satisfies the specifications.
   Specifications: +5.0 V ±0.1 V
5. Connect the digital voltmeter to the GND terminal (TP903) and +3.3 V terminal (TP902) on the OPM-39/39P board.
6. Adjust the +3.3 V adjustment volume (⊘RV902) so that the voltage satisfies the specifications.
   Specifications: +3.3 V ±0.1 V



7. Remove the digital voltmeter.
8. Attach the board stopper assembly and front panel in reverse order of steps 1 through 2.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 3.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 5.25 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 20 V AC range are suitable. (See Fig. A)

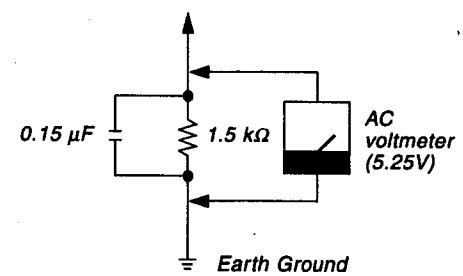


Fig A. Using an AC voltmeter to check AC leakage.

DFS-700 (UC)
DFS-700P (CE) E
9-967-897-01

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